

THE BULLETIN

OF THE ATOMIC SCIENTISTS



**European theater nuclear forces
NRC and thyroid protection
The 1980 candidates**



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Drawing by Miriam Turner, aged 13

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JEROME D. FRANK

'If you win, you lose.'

Technological advances, by changing conditions of life in significant ways, produce psychological and social stresses. Persons and societies struggle to change ingrained, habitual patterns of behavior and long-established institutions to adapt to the new conditions.

Of all the products of our age of *galloping technology*, to use the apt phrase of the *Bulletin* editor, the most jolting has been the sudden huge leap from non-nuclear to nuclear weapons. General Douglas MacArthur, having lived through the process, described the breakneck pace of weapons development vividly:

"At the turn of the century, when I entered the Army, the target was one enemy casualty at the end of a rifle or bayonet or sword. Then came the machine gun, designed to kill by the dozen. After that—the heavy artillery, raining death by the hundreds. Then the aerial bomb, to strike by the thousands, followed by the atom explosion to reach the hundreds of thousands. Now, electronics and other processes of science have raised the destructive potential to encompass millions. And with restless hands we work feverishly in dark laboratories to find the means to destroy all at one blow."

It is a truism that humans react to their perceptions of events rather than to the events themselves. From the days of spears and clubs, weapons have conferred strength upon their possessors, both in appearance and in actual fact. The image of strength projected by a large stockpile of non-nuclear weapons was based on real strength; therefore, it was realistic for national leaders to rely on them to reassure themselves, intimidate their actual or potential enemies and hold the loyalty of their allies.

Nuclear weapons have abruptly and permanently broken the connection between weaponry and strength in one respect, but not in another. Perceived and actual reality still coincide, in that strategic nuclear weapons in the hands of one adversary gravely menace the other. They differ sharply, however, in that beyond a certain point the more a nation possesses, the stronger and more secure it and other nations perceive it to be, whereas in actuality the reverse is true.

Beyond a level long since passed by the United States and the Soviet Union, accumulating more powerful and

sophisticated strategic nuclear weapons increases the danger to all nations, including the possessor. It stimulates the spread of these weapons to nations that do not now have them, thereby increasing the probability of their being launched by accident or malice, and also assures that they will eventually fall into the hands of terrorists.

When one considers the level of fear caused by a minor leak of radioactivity from a crippled nuclear reactor, one can imagine the panic that would be created by the explosion of even a small, primitive nuclear bomb by terrorists.

Yet the nuclear race between the major powers continues at a furious pace. The non-nuclear nations seek frantically to lay their hands on nuclear weapons of their own.

Leaders of the nuclear nations climbed to power before nuclear weapons burst upon us, so they try to deal with these weapons as if they were conventional ones, despite an intellectual awareness that they are not. Intellectually, they may be in the nuclear age but emotionally they are still back in the days of spears and clubs. They are experts at the old international game of deterrence and war—lethal games in a nuclear world, but the only games they know how to play.

The most ominous development resulting from psychologically equating nuclear with pre-nuclear weapons is the delusion that a nuclear war can be won, with a concomitant shift to a policy of waging war with them. To this end, arms experts have produced elaborate scenarios of civil defense and the use of tactical nuclear weapons.

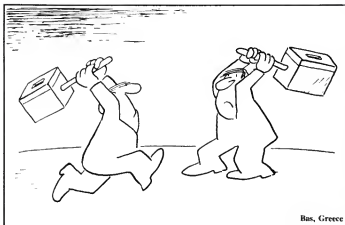
General MacArthur went on to say:

"The very triumph of scientific annihilation has destroyed the possibility of war being a medium of practical settlement of international differences. No longer is war the weapon of adventure whereby a short-cut to international power and wealth can be gained. If you lose, you are annihilated. If you win, you stand only to lose. War contains the germs of double suicide."□

Jerome D. Frank, M.D., is professor emeritus of psychiatry at The Johns Hopkins University School of Medicine in Baltimore, Maryland.

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ARMS/ DISARMAMENT



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by Steve J. Heims

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BERNARD T. FELD

Madder than MAD

The recent reports on the official adoption by the Carter administration—under pressure from the Reagan candidacy—of a strategy of nuclear war fighting based on a so-called limited, counterforce exchange raises the serious question of whether our leaders have taken leave of their senses. Stripped of its technical-sounding, defense analyst jargon, what the decision means is that we are telling the Russians (and the world) that not only are we prepared to use our nuclear weapons first in the case of a conflict, but that we intend to use them in an entirely offensive mode in an attempt to destroy the Soviet nuclear forces before they can be used against us. Such a move on our part is supposed to be taken by the Russians as an invitation to surrender. If they are not prepared to do so—or if we succeed in destroying their leadership (one of our primary counterforce targets) so there is no one who could officially surrender—we are prepared to go on destroying target after target until we run out of targets or missiles.

One of the arguments for this new strategy is that the Russians, whose missile forces are allegedly even larger than ours, have already adopted the same nuclear war-fighting or counterforce strategy against us. At some point in a counterforce exchange, it is assumed one of us will say "Uncle" (we are never told how this could be arranged in the midst of all the nuclear carnage, however); then we'll both quit, lick our wounds, pick up the pieces start rebuilding our societies and nuclear forces in anticipation of the next crisis.

If ever a doctrine was designed as a self-fulfilling prophecy, this is it. In the "monkey see-monkey do" tradition of the nuclear arms race, the Soviets are sure, eventually, to adopt our new strategy. With both sides poised to wipe out the other's forces first, there is an immense premium on striking first in a time of crisis. Nevertheless, we are assured that this new strategy is more likely to deter the Soviets from military adventurism, even of a conventional variety, than the old mutually assured destruction (MAD) strategy of threatening retaliation against population centers in case of the outbreak of nuclear war. Furthermore, we are reminded that this is not *really* a new strategy, since the policy of counterforce has been implicit in the nature of our nuclear deployments ever since Nixon's Secretary of Defense, James

Schlesinger, repudiated the MAD strategy in the early 1970s. All that is now being done is to recognize officially the inevitable consequences of technological advances that have made counterforce possible.

But if the MAD system of civilian hostages is thought to be unacceptable on humanitarian grounds, to accept these arguments for the new limited war strategy is the ultimate in barbarism. The main point of the MAD strategy was the universal recognition that

- for either the United States or the Soviet Union to carry it out would represent an irresponsible act of insanity;
- any use of nuclear weapons is overwhelmingly likely to grow (escalate) into a full-scale exchange with overwhelmingly disastrous consequences for both sides;
- the present state of huge nuclear deployments and of a vigorous technological race for their increase and improvement is unacceptable for any long-range perspective;
- the major objective of both sides—irrespective of our other political and ideological differences—must be the mutual limitation and reduction of our present vast overkill capacities to wage nuclear war; and
- a stable world demands U.S.-Soviet cooperation if we are to avoid the universal spread of nuclear weapons.

That was what SALT was about. Unsatisfactory as the results of SALT I and II were, their continuance is infinitely preferable to the state of worldwide nuclear anarchy into which we have rapidly been drifting since SALT's demise. That is why the replacement of MAD by the new strategy of limited nuclear war represents a frightening regression. To believe and act otherwise is to play into the hands of the madmen on both sides who profess to believe that a nuclear war can be fought and won and that international problems can be solved on this basis.

The truth is that a nuclear war between the superpowers will be the last world war for centuries to come, with the only victors the radiation-resistant cockroaches. To play with doctrines of a fightable nuclear war is the ultimate folly. □

From Jerusalem

FRANK BARNABY

A frangible peace

Israeli Prime Minister Menachem Begin signed the 1978 Camp David Accords for peace in the Middle East on a false assumption. Begin hoped, it seems, that what he perceived as great generosity in recognising Egypt's sovereignty over the Sinai, and the oil fields and military airfields there, would be recognised as such by the Americans and Egyptians. Begin hoped, in return, to be able to keep an Israeli military presence in the West Bank of the Jordan (and the Golan Heights) for the foreseeable future. This military presence would be a comprehensive one—including the deployment of tanks, the maintenance of an early warning attack system, military intelligence apparatus, and so forth. The Israelis would retain the right to fight terrorism in the West Bank—Judaea, Samaria and Gaza—and to veto the entry of certain PLO members. The Palestinians in the West Bank would, according to this plan, be self-governing in such matters as culture, municipal government, civil police, welfare, education, health, and so on. Prime Minister Begin apparently took for granted Israel's continuing to build new settlements in the West Bank.

No precise decisions were taken about the actions the three parties could take, or not take, after the Camp David agreement was signed—a bad mistake in diplomacy.

Frank Barnaby, director of the Stockholm International Peace Research Institute and a member of the Bulletin's International Council, wrote this commentary last August while in Jerusalem.

particularly with such an ambiguous (some say contradictory) agreement. Hence the misunderstandings that have since arisen.

Begin continued building settlements in the West Bank, and was surprised at the international furor this caused. The Americans assumed that if they could persuade the Israelis to leave the Sinai, they could prevent new settlements being built in the West Bank. Arab leaders accused Sadat of softness at Camp David. If he had negotiated harder, they argued, Israel, under American pressure, would have given away more than the Sinai.

Israel's main foreign policy goal is peaceful and *secure* co-existence with the Arab states. The Camp David accords have achieved this insofar as Egypt—the biggest strategic threat to Israel—is concerned. The snag is that the Palestinian problem has in no way been solved. But is there a solution to this problem?

Israel simply will not agree to the West Bank being militarised by anyone but them, at least if this includes Palestinian tanks and combat aircraft. (It takes just 10 minutes for car travel from Jerusalem to Bethlehem. And Bethlehem is an Arab town in the West Bank.) Equally, a Palestinian state will insist on having armed forces, complete with tanks and combat aircraft. In this day and age which new state wouldn't? Given this basic dilemma, many Israeli intellectuals and others are opting for the idea that Jordan and the West Bank should jointly become the Palestinian state, on the strict understanding that the West Bank will remain a demilitarised

zone. But it seems unlikely that Jordan's King Hussein would agree to this, at least for some time to come. He may be attracted by advantages like having Gaza as a gateway to the Mediterranean but put off by the likelihood that his new enlarged country would be far less stable than Jordan is now.

The present official position is that since the majority of the Palestinian Arabs are citizens of Jordan and the majority of Jordanians are Palestinians, the ultimate solution to the problem of Palestinian Arab self-determination is that Jordan should become the Palestinian Arab homeland.

East Jerusalem is an even more complicated problem than the West Bank. If—and only if—a satisfactory form of Palestinian autonomy can be established, then no doubt the political will would emerge to solve the problem of Jerusalem. Perhaps the Holy Places could be de-politicised and the city, as is being suggested, divided into self-governing municipalities (or boroughs) while retaining its basic unity.

Talking to Israelis soon brings home how powerful the influence of the Holocaust still is. Many Jews (and others) at first refused to take seriously Nazi threats to eliminate Europe's Jews: the whole thing was unimaginable, too horrible to contemplate. Then Hitler killed 6 million Jews, fully one-third of world Jewry. After such an appalling lesson, it is hardly surprising that Israelis (particularly some senior Ministers) now take threats to their annihilation seriously. The rest of us may believe that the threat in the PLO covenant to eliminate Israel is just propaganda and should be ignored; but we should not be surprised when Israelis believe it. We may criticise Israel's refusal to deal with the PLO but it is easy enough to understand it.

The PLO issue is, of course, a

gruesome dilemma in the Middle East situation. Israeli recognition of the PLO as a negotiating body seems to be a pre-condition for a solution to the Middle East problem. The PLO, after all, effectively controls the Palestinians in Israel. Yet the Israelis' historical experience makes this recognition virtually impossible as long as the PLO insists upon its present covenant.

Begin's government is increasingly unpopular, for domestic-economic rather than foreign-policy reasons. But it has signed a peace treaty with Egypt—something a left-wing government might not have been allowed to do. Only time will tell how fragile the treaty is.

In the meantime, external powers seem intent on complicating matters in the Middle East. I have in mind American sales of offensive arms to Egypt, Jordan, and Saudi Arabia; French (and to a lesser extent Italian) sales of nuclear equipment and material to Iraq; and Soviet nuclear sales to Libya. The superpowers seem to be letting events in Iran, Afghanistan, and so on, control their activities in the Middle East region. And France, which plays a particularly negative role, seems to act solely on narrow national and commercial grounds.

The "rapid deployment force" the United States is developing to be able to respond rapidly with military force to contingencies in the Middle East requires access to military facilities in the area. The most forthcoming offer of facilities has come from President Sadat. Egypt has for some time allowed the United States to fly airborne warning and control system (AWACS) aircraft in and out of Egyptian airfields on surveillance missions over the Persian Gulf, Arabian Sea, and Indian Ocean. The Egyptians will now allow the United States to station fighter aircraft at Egyptian airfields on a regular, but

probably not permanent, basis.

To test the new arrangement, a squadron of 12 U.S. Air Force F-4E fighter-bombers are stationed at Cairo West air base. The aircraft, accompanied by some 400 U.S. flight and ground personnel will train with the Egyptian Air Force until mid-October, in an exercise code-named "Proud Phantom."

The United States has sold Egypt 35 F-4 Phantoms. It intends to sell Egypt 40 F-16 fighters and other equipment (including missiles, ammunition, bombs and spare engines) worth \$960 million, as well as 11 mobile Hawk surface-to-air missile batteries, 550 armoured personnel carriers and 244 tanks. These deals are all part of a rapidly expanding military tie-up between the United States and Egypt—a tie-up brought on by events on the periphery of the Middle East rather than dictated by the needs of the developing Egyptian-Israeli relationship.

Egypt, in fact, wants to build American weapons and to scrap earlier plans to build British and French ones. Specifically, negotiations are

going on for licenses to build Northrop F-5s (instead of the Franco-German Alpha jet combat aircraft) and Bell 214ST helicopters (instead of the British Lynx). Sadat's military plans are likely to cost him several billion dollars over the next few years, most of which will be provided by the United States.

The Palestinian problem is the most commonly thought of threat to the fragile peace between Egypt and Israel. But there are others. One is a domestic political upheaval in Egypt brought on by population pressure, urbanisation, increasing poverty, graduate unemployment, etc. Another is the spread of nuclear weapons in the region.

Economic aid to Egypt is, therefore, far more important than military assistance. And countries should be extraordinarily cautious about exporting nuclear equipment and material to the Middle East. It is hard to think of any local development in the Middle East more likely to wreck the peace than the emergence of new nuclear-weapon powers. □

Josephine Wertheim Pomerance 1911-1980

On July 16, Jo Pomerance died. A devoted activist on behalf of the United Nations and especially of its arms control and disarmament efforts, she was also a long-time supporter of and contributor to the *Bulletin of the Atomic Scientists*.

In recent years, Jo concentrated her energies on conclusion of negotiations on the Comprehensive Test Ban, so long on the verge of acceptance. The rapid adoption of the Test Ban would serve as a fitting monument to Jo's lifetime devotion to the cause of Peace.



The cold war

In the following commentary, the Nobel chemist and longtime Bulletin reader, Professor Robert Mulliken, expresses his views on Soviet-American relations. It will be evident to regular Bulletin readers that the editors do not agree with Mulliken's general assessment.

However, we live in the same world, are confronted with the same facts and events and use the same processes of logical reasoning to try to understand the facts. This then is our dilemma.

How do we engage the American people in the weighing of the risks of a continued nuclear arms race against the risks of detente and arms control? What is at stake for the Russian people and the American people is the preservation of our societies.

— THE EDITORS

In 1976 the Committee on the Present Danger wrote to ask me if I would join them. I thought for five minutes back to 1936 when I felt that it was about the last moment to stop the Hitler menace and how, at that time, most people did not want to bother. There was the Munich surrender and then, in 1939, Chamberlain's "peace in our time."

It seemed to me that the massive Soviet military effort since the end of World War II was at least as great a menace to the world as was Hitler in 1936. So, I said yes to the Committee. Much time has passed since 1976 and we have done little.

For some time I have felt that the *Bulletin* has leaned too strongly toward detente with the Soviet Union and I

planned to submit a letter to the Editor. Notice of a new book by Richard M. Nixon, *The Real War*, made me decide to wait until I had read it. Nixon gives a straightforward account of America's situation in the world today. He makes a strong plea for national unity and will in facing the Soviet Union. Such a book coming from him may be a surprise to many but it should be taken on its merits. I think everyone should read it.

Nixon emphasizes that we and the rest of the world have been continuously engaged since the end of World War II in a very real Cold War with the Soviet Union in which they have been immensely successful while we and our allies have retreated steadily. This is Nixon's *Real War*—a war in which the Soviets use every possible means, fair or foul, to advance their objective of Soviet communist domination of the world.

In recent years we have responded to Soviet propaganda by embracing detente with this coldly calculating and unrelenting adversary. I do not mean to suggest that we should not talk to the Soviets; I agree with Victor Weisskopf and Robert Wilson that we should maintain friendly contact with individual Russian scientists. But, let us consider some aspects of the Cold War in more detail.

One of the Soviet's greatest successes has been in spreading propaganda in both obvious and subtle ways. They constantly distort words and ideas that have special meaning for us. They tell the world that we are the imperialists and they the liberators. They speak of peoples' democracies,

which are really totalitarian dictatorships. They say they want peace and we want war. Sometimes they even admit of their purpose. Khrushchev said, "We will bury you."

I don't know what our Voice of America and Radio Free Europe are telling the world. The U.S. government does not allow them to broadcast in this country. However, Solzhenitsyn, in the Spring 1980 issue of *Foreign Affairs*, writes that our broadcasts to Russia are often frivolous and inept. What we ought to do, especially for Third World countries, is not just to tell about the United States but also the brutal truth about the Soviet Union.

In reacting against the Soviet government, there is no reason to consider the Russian people our enemies. In fact, as Solzhenitsyn emphasizes, they are the chief victims of their government. Also we must remember that besides the Russians, there are many submerged nationalities in the Soviet Union.

What do the Soviets want as they extend their aggressions around the world, most recently in Afghanistan, and build up their nuclear and conventional military forces to alarming proportions? I believe that they want to hem us in on all sides, put us in their power and make us do what they want. It is doubtlessly unreasonable for them to exterminate us and all our valuable riches in knowledge and technology. However, they can try to blackmail us, for example, with the threat of limited nuclear war through a first strike perhaps about 1982. Since this might by mischance lead to a full nuclear exchange, they must

feel that they are prepared to win such a war. If this should happen, our nation and civilization could expect to be annihilated. The Soviets would have suffered huge but bearable losses and could plausibly expect to survive, especially in view of the extensive civil defense preparations they have been making.

In the 1950s we too thought of making civil defense preparations but our scientists persuaded the government not to make them by arguing that if we invest in civil defense, the Soviet Union would think we were preparing for war. What nonsense! The Soviets have had no inhibitions about their own defense preparations. However, I doubt whether any preparations we could have made would help very much.

I would resent being classified as a "hawk." I have always been utterly appalled at the terrible human loss and destruction in warfare and the waste of resources that could have been put to constructive use for the benefit of mankind. When I was studying chemistry and chemical engineering at the Massachusetts Institute of Technology, we were not yet involved in World War I. When I graduated in 1917, we were in the war, and my first job was under James Conant in a civilian laboratory where we experimented with all the poison gases known to man. I had no compunctions; we had to win the war. As a chemist I was worth more in the

laboratory than in the Army. But I must confess that I had no desire to be shot at and probably would have been worthless in the Army. However, just before the war was over I was put into the Chemical Warfare Service and became a Private First Class.

Who is responsible for the truly mad state of the current nuclear arms race? Some say that we and the Soviets are equally at fault. I don't believe it. The Soviets rejected the Baruch plan and went ahead to build up their nuclear arsenals. Could we lag behind? There may have been times when we were unnecessarily far ahead but certainly not now.

Surely, nearly all Americans want peace, not war. But with the Soviets as they are today, we desperately need more military preparedness and regrettably this means nuclear weapons. To keep up with the Soviets, again regrettably, we need a better Army and Navy. Also, I am not quite sure whether SALT II is better than nothing, or worse than nothing. In any case, it does not represent what we need in the major dilemma of the nuclear arms race. My dearest wish would be the total elimination of all nuclear weapons without foregoing the peaceful uses of nuclear energy.

Who are the people who must carry on the responsibilities for our military security? First of all, there are those who make the military a profession, both in the lower and higher ranks. We should encourage their enthusiasm about their profession but not necessarily agree with all their conclusions. Then there are the industrialists who make a profit on arms manufacture. In our system, which I support, this is necessary, but the industrialists must not conspire with the military to develop what is not necessary. Finally, there are the scientists who carry out the military research and development.



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Even if most of all these people do what they do just to make a living and not for patriotic reasons, let us not discourage them. We need them.

Among those often accused of promoting the arms race is Edward Teller, the father of the H-bomb. He knew it was necessary to avoid falling behind the Soviets. I recall one Christmas, I think it was 1951, when my wife and I had dinner with Edward and Mitzi at their apartment in Chicago when he was on the University of Chicago faculty. Without telling us what it was, Edward spoke with deep feeling about a very terrible thing that most unfortunately had to be brought to reality.

The U.S. government has two main agencies to deal with international affairs, the State Department and what used to be called the War Department. I fear we are imitating the hypocrisy of the Soviets in calling the latter agency the Defense Department. Why not call it the Military Department? We certainly need a better State Department, but however much we regret it, the overwhelming need is to strengthen, as quickly as possible, our Military Department. We should make whatever sacrifices are necessary even at the expense of more inflation. We should also radically improve and enlarge our propaganda offensive.

I am skeptical of schemes as remote and cumbersome as MX missiles in 1990. We may, of course, hope that something good will happen in the meantime to prevent any need for them. History shows that very unexpected things occasionally do happen. But don't count on it! We are in the midst of a Cold War with an unrelenting foe and must do all we can to avoid defeat. Everything takes time, usually much time, and we should first emphasize effective steps that can be taken most quickly. There is no time to lose. □

Afghanistan: a created crisis

Are we being conned or brainwashed into an international crisis leading to Cold War II and risking World War III? The thought will not exorcise itself.

The present crisis has important domestic components. Soberly analyzed, it appears to be much more the result of the American response to the Soviet intervention in Afghanistan than the intervention itself. The American reactions to the intervention are not only uncalled for; they primarily hurt our own country, contribute dangerously to international tensions, cause trouble with our allies and cannot possibly succeed in their proclaimed objectives. Such policies may serve domestic political interests. But do they serve American national interests?

Is there any way the Soviet intervention could be rationally seen other than a response to what the Kremlin perceived as a threat to its security? To suggest this is by no means to justify the intervention. But is there any other possible explanation? Afghanistan is one of the poorest, most resourceless, primitive and barren countries on the face

of the Earth; there is nothing there to exploit. It is, however, on the border of the Soviet Union, and it also borders on Moscow's great adversary, China, and on China's unstable ally, Pakistan, as well as on chaotic Iran. And in December 1979, Afghanistan's own chronic instability was deteriorating fast. There was nothing new about Soviet influence there. But it seemed to be in danger of disintegrating. Whether the CIA was aiding and abetting the process is not clear.

That Afghanistan is important to Soviet security—let me repeat—does not justify the intervention, but it does help explain it. This is, alas, the way powerful nations act in the present sorry state of the world when they perceive a threat to vital interests.

Afghanistan cannot reasonably be considered an important American security interest. There is no way that the Soviet intervention in Afghanistan constitutes a threat to American interests. Only one totally unfamiliar with the virtually impassable terrain between Kabul and the Iranian oil fields could suggest that a concentration of troops around the former threatened the latter.

There is no evidence that the Russians want to take over Iran or the Gulf, but, if they did, they already have a natural invasion route directly from their own border, through Azerbaijan and along the Caspian Sea. An analogy to the Russians moving into Afghanistan to take over Iran would be a California



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ROBERT GOMER

Election thoughts

drive into southern Nevada in order to take over Oregon.

The idea that detente was destroyed by the Soviet intervention in Afghanistan is equally ridiculous. American-Soviet detente was already in trouble when Carter took office. But the real attrition dates from January 20, 1977. First there was the "human rights" attack on the Soviet Union, then the 1977 effort to undo the SALT negotiations, off-again on-again trade embargoes, military build-up, the flap over the small and long-stationed Soviet troop units in Cuba, the breaking off of negotiations for demilitarization of the Indian Ocean, the anti-Soviet orientation of the Camp David Accord, the refusal to talk with Brezhnev about his offer to reduce nuclear weapons in Europe followed by the NATO decision to deploy new American missiles in Europe, and finally the virtual abandonment of SALT II.

The present crisis is immediately dangerous because the whole Middle East is volatile and unstable. But the long-term dangers are even greater. No matter how difficult the Russians are to deal with, we must remember that there is really no alternative to at least some kind of minimally cooperative relationship—some kind of detente—with them if we hope to survive in the thermonuclear world. Only this offers hope for nuclear arms reduction and peace.

That is one of two important political realities. The other reality is that the growing cold war psychology in the United States makes such constructive relationship with the Soviet Union difficult if not impossible without competent, far-sighted and determined leadership. The present prospects for such leadership, alas, are not encouraging. □

Any thoughtful observer of the United States on the verge of this presidential election has grounds for deep concern. We seem a nation in considerable disarray. We are not dealing effectively with most of our major problems. Inflation rages. We have done virtually nothing about obtaining alternative energy sources to imported oil. We have not begun to change our energy use patterns, except for a slight improvement in gasoline consumption. Our cities are in decay. Our farmland is being gobbled up by housing at the rate of 1 percent a year. Crime is rampant. A permanently unemployable underclass is perpetuated by a breakdown of public education and a rigid welfare system. We have failed even to agree on the need for halting the arms race.

We seem more an assortment of separate interest groups than a nation. Labor and industry together push the wage-price spiral upward. The defense industry and the hardliners push for more arms spending, and a weak president gives in. Industry pushes for a relaxation of environmental standards. The anti-nuclear lobby prevents a rational discussion of nuclear energy.

If ever strong and wise leadership is needed to unite the nation, to per-

suaide an indecisive Congress into passing necessary legislation, to persuade the American people that a considerable measure of self-discipline, and some decreases in living standards and expectations are necessary and inevitable, that time is now.

What are we getting from the Democratic and Republican parties? President Carter lacks in some essential way the necessary qualities of leadership. His "malaise" speech of some months ago was an attempt to tell us something that needed to be said; what came across was not inspiration, but scolding. He has failed signally to communicate either to Congress or to the public a sense that his Administration has thought through substantive programs on energy, cities, welfare, or education, and has thus failed to get any real programs initiated in these areas.

In foreign policy Mr. Carter has by and large tried to improve our stance from blind support of anti-communism, no matter how dictatorial, corrupt, and unviable, to a more reasonable one. Ironically enough, prior American mistakes in just this area of foreign policy have borne fruit in Iran and in parts of Latin America during his term of office, and he is widely being blamed for it. But even here Mr. Carter has not shown himself strong. The abortive attempt to rescue the Iranian hostages was the action of a weak president under pressure.

In the field of arms control the Carter administration and the Soviet Union have come up with a treaty, the result of more compromises within each country than between them, which



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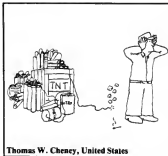
He is a member of the *Bulletin's* Board of Directors.

does little more than to institutionalize the arms race. Probably even this treaty would not be ratified by the Senate today. It is very difficult to say if Mr. Carter could have done better; at least he made *some* attempt at arms control. Once again, however, he failed signally to influence public opinion, to educate the public to the need for arms control, or even to make the attempt. Also, in order to get SALT II accepted by the hawks he seems to have promised them more new weapons systems than the treaty may be worth.

It is inevitable that dissatisfaction with all the problems facing us would be transferred to the incumbent president, regardless of how much he or anyone else could have done about them. In Mr. Carter's case the dissatisfaction seems not wholly unjustified. It is alarming just the same that it results in a widespread willingness to accept unrealistic alternatives.

The solutions offered by Ronald Reagan are appealing in their simplicity but little else can be said for them. In part they consist of denying the problem, as with energy. In foreign affairs, his approach is fraught with enormous danger. Our complex relations with the Soviet Union—who is our antagonist, but of necessity also our partner in a joint search for survival and a way out of the insane spiral of the arms race—cannot be dissolved by abrogation.

Mr. Reagan also advocates substantial increases in strategic armament, with a view to achieving "superiority." It seems most unlikely, in fact impossible, that such superiority can be achieved in the sense that we need not fear even a first attack by the Soviet Union or any other power. It is just barely conceivable that an acceleration of the arms race, or even a continuation at its present pace, may lead to a situation where a first, preemptive attack by either side could,



Thomas W. Cheney, United States

in fact, knock out the other's ability to retaliate effectively. Fortunately, because of submarine forces and other uncertainties, even this possibility is remote. Fortunately, since such a situation would be totally unstable and thus would pose unimaginable danger. Since each side has always responded to moves by the other, it seems even less likely that one side could achieve or maintain a preemptive first-strike position unilaterally. Thus it is hard to see how our position in the world can be improved by making us stronger militarily, since this strength cannot be used without imperiling our existence.

The strengths we need lie in providing decent public education; revitalizing cities and industry; coping with inflation; disciplining ourselves in the use of energy and land; and coming to terms with the fact that the finiteness of natural resources also puts limits on economic growth. If elected, Reagan may discover a world far more complex than the one he is talking about; it is not clear whether the people who will have elected him will also agree to face that world.

It is depressing that the only candidate publicly acknowledging most of the realities of 1980, Representative John Anderson, has had to run outside of the major party structure. Quite apart from the fact that this throws into considerable doubt his ability to govern (if by chance he

should be elected), it says something disturbing, not only about the major parties, but about the body politic as a whole. How is it that a people of 220 million cannot come up with better leaders?

It is impossible for any of us, immersed in the here and now, to see clearly what our present troubles really portend. Mr. Carter's attempt to turn the Democratic Party from blind adherence to the inflationary sanctities of the New Deal, probably a necessary change in these much altered times, seems to be failing because of his limitations as a leader and because he has not offered constructive alternatives. The result is a party in apparent chaos. In good years Republican programs seem to be more restrained versions of Democratic ones; in bad years they are nostalgia for the nineteenth century. Taken together, it is not unreasonable to conclude that the two major parties do not respond very well to the needs of our time.

Is this then a stage of transition in which a basically healthy democracy is undergoing the pangs of necessary change? Are we in the process of replacing outworn leaders and forms, either by changing the present parties from within, or by creating new ones? May we perhaps even see the beginnings of parliamentary democracy emerging from the frequent inability of administrations to govern effectively? Or is the body politic as a whole demoralized, sunk into apathy and narrow self-interest? One senses both trends, and it is quite unclear at the moment which will prove stronger. If it should be the latter, a probable result would be the breakdown of democracy and the emergence of an authoritarian regime, invoked, of course, in the name of freedom, democracy, and patriotism. If we do not watch out we may not even recognize the difference. □

**Someone will be elected president next month.
An analysis of the positions of the three major presidential candidates
on arms control, defense, energy, and science policy.**

W. A. THOMASSON

The candidates 1980...

No matter what one may think of the long-term prospects and attractions of the Citizens Party, the Libertarians, or any other third, fourth, or fifth party, the fact remains that the President elected in November is going to be one of three men: Jimmy Carter, Ronald Reagan, or John Anderson. It is therefore what they think on matters of arms control, defense, and energy that is of immediate practical significance.

The inclusion of Anderson in this list may require some justification. After all, no third party or independent candidate has ever succeeded. Lincoln cannot be considered a "third party candidate," since in 1860 the Whigs had collapsed, with the Constitution Party constituting an insignificant rump. And the Democrats were irreconcilably split.

In fact, in discussing Anderson's chances it is necessary to specify precisely what is meant by "success." If success is defined as capturing a majority of electoral votes then those chances are remote indeed. Certainly any possible scenario leading to that result must begin with a successful court challenge of the laws that will apparently keep him off the ballot in a dozen or more states.

If, however, "success" is defined as throwing the race into the House of Representatives, then it is not merely a theoretical possibility but may well be rather more likely than not. The justification for this statement lies in the northeastern—New England and Middle Atlantic—states. These states held 15 pri-

maries, of which Carter and Reagan between them won exactly six. These include relatively meaningless Carter victories in the heavily Republican states of New Hampshire and Vermont, two Reagan victories on June 3, when he had already effectively clinched the nominations, and Reagan's Vermont "victory" in which he garnered exactly 30 percent of the vote—compared to a combined total of 51 percent for Bush and Anderson.

If these results suggest people in the northeast are willing to vote for anyone but Carter or Reagan, the polls agree. They currently show Anderson leading in six of these states; any further slippage by Carter and Reagan could well put all nine—122 electoral votes—in the Anderson column. An Electoral College victory for Carter or Reagan would then require one of them to win 85 percent of the remaining electoral votes. To describe this as unlikely is to understate the obvious.

The conventional wisdom, of course, is that throwing the election into a (presumably) Democratic House of Representatives would simply assure the reelection of Jimmy Carter. This wisdom need not hold, however, if Anderson were to finish ahead of Carter in either the electoral or the popular vote, providing the necessary excuse for anti-Carter Democrats to desert their party's nominee. Since Carter's well-known "ineffectiveness" largely reflects his inability to establish effective working relationships with Congressional members of his own party, the

number willing to vote for an independent candidate could be substantial.

It thus becomes quite conceivable—by no means certain, but entirely possible—that a Congressional coalition of liberal Republicans and anti-Carter Democrats might elect Anderson the first American President without party affiliation since John Quincy Adams (who was also selected by the House of Representatives).

An Anderson victory over Reagan would not have the same result. It would, however, insure that the 1984 Republican nominee would be either Anderson or somebody acceptable to him. This just might have been his main goal from the beginning.

In order for Anderson to beat either Carter or Reagan he must increase his share of the vote approximately 50 percent over his mid-July totals in the polls. At the moment this appears something of a long shot. However, in a campaign which has already proven notoriously volatile, and considering how many people say they would vote for Anderson if he had a serious chance, the possibility is one which cannot be ignored.

So there are three serious candidates to choose from, and three sets of positions to consider. (The party platforms, as such, can be disregarded. Everyone else, including the nominees, will disregard them once the conventions are over.) The candidates' positions, have been grouped under general headings, in an attempt to reflect the major concerns of most *Bulletin* readers.



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SALT II and arms reduction. President Carter withdrew the SALT II treaty from consideration after the Soviet invasion of Afghanistan. However, he has now resubmitted it, though no action is expected until the next Congress begins in January. At that time it is clear that he will support the treaty as he has done in the past. How vigorously and how effectively he will fight for it, however, is in some question.

Following ratification of SALT II, according to a Carter spokesman, the President,

"will begin negotiation with the Soviets in SALT III on a complex agenda of arms control issues. These issues include significant reductions in strategic weapons, further qualitative limitations, limitations on long-range theater nuclear systems, and still further improvements in our ability to verify arms control agreements."

Anderson likewise states that he has strongly supported and continues to support ratification of SALT II, though he agrees that the Afghanistan invasion temporarily created a political environment in which ratification was unlikely. He is, however, more emphatic than Carter in pointing out that following ratification, "less than a year will remain for the protocol. We should therefore begin SALT III in a timely fashion and try to achieve a SALT III agreement as expeditiously as possible."

One of Anderson's original ideas as to how these negotiations might take place is the three-tier system. Negotiations would occur simultaneously at three levels: between the United States and the Soviet Union on "central strategic systems"—ICBMs and such; between NATO and the Soviet Union on "Euro-strategic

systems"—essentially, an effort to trade limitations on British and French nuclear delivery systems for restrictions on such Soviet theater weapons as the Backfire bomber and the SS-20 missile; and negotiations between NATO and the Warsaw pact countries on reductions in conventional weapons. While theater and conventional forces reductions are already on Carter's agenda, the formal three-tier system would appear to give them greater prominence and urgency.

Anderson also suggests the usefulness of requiring that when new, more advanced types of weapons are substituted for old ones it be on a less than one-for-one basis. Thus, he says,

"By pitting the qualitative arms race against the quantitative arms race, we can leave it to the military establishments for both superpowers to choose between large numbers of decaying, obsolescent weapons and smaller numbers of more secure, modern systems. This tradeoff should be an important negotiating objective since it will add to the overall stability of the strategic balance."

Reagan, by contrast, says, "SALT II is not Strategic Arms Limitation; it is Strategic Arms Build-up, with the Soviet Union authorized to add a minimum of 3,000 nuclear warheads to their arsenal, and the United States embarking on a \$35 billion catch-up program which will not be complete until 1990, if then. I believe the SALT II treaty should be withdrawn." On future arms limitations talks his position is,

"Should subsequent behavior by the Soviet Union indicate that a reversal of current Soviet policy [as exemplified in Afghanistan] is credible,

then the United States should be prepared to discuss an arms limitation agreement which legitimately reduces nuclear weapons on both sides to the point where neither country represents a threat to the other."

Both Carter and Anderson support a comprehensive test ban treaty involving the United States, the Soviet Union, and the United Kingdom. Such a treaty, they agree, should cover all nuclear explosions and—since it will not include all nuclear powers—should be for a fixed term (Anderson suggests 3 to 5 years). Reagan has no position on a comprehensive test ban.

MX and other strategic weapons. Both Carter and Reagan support deployment of land-based MX missiles. Carter (or the Defense Department, which comes to the same thing) initially proposed the so-called "race-track" basing mode but now, in the face of opposition from areas where it would be sited, appears to be considering more compact (but possibly less secure) alternatives. Reagan describes race-track deployment as, "enormously expensive and complicated, and . . . unworkable." He says, "There are many alternative approaches to mobility," and, "we should seek a survivable basing mode . . . that will be readily deployable at an early date," but does not identify any particular alternative.

Anderson, on the other hand, says, "I have opposed development and deployment of the MX missile system as currently planned. Not only will this system be outrageously expensive and environmentally unsound, it will fail to address the fundamental need to enhance American security." He adds, "As an artilleryman during World War II, I was

**'SALT II is not Strategic Arms Limitation;
It is Strategic Arms Build-up.' —Ronald Reagan**

taught to keep my head down and avoid drawing enemy fire. The proposed MX system will have exactly the opposite effect, giving Soviet military planners from 4,600 to more than 9,000 new targets in the United States at which to aim Soviet nuclear weapons." As an alternative he suggests, "If we truly need the increased capability that the MX would give us, we can acquire it almost as quickly, at lower cost and with far greater security by deploying a missile like the MX at sea aboard small conventionally powered submarines operating off our coast in waters we can easily patrol and defend."

While Reagan agrees with Carter on the MX, he disagrees with previous Carter decisions on the neutron bomb and the B-1 bomber. About the B-1 he says, "The Carter administration's unilateral decision to scuttle production of the B-1 bomber was a serious mistake. The manned bomber is a critical leg in the strategic weapons triad; by not building the B-1, we have weakened the triad system. The United States should [therefore] proceed swiftly to

reopen production of an advanced manned penetrating bomber that will fully exploit the \$5 billion investment in the B-1 bomber program, and provide a capable weapon system for U.S. forces with the performance characteristics of the B-1 at the earliest possible date."

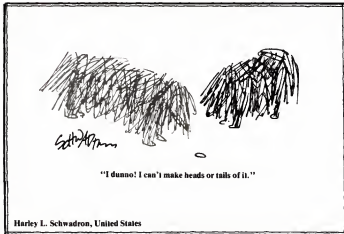
On the neutron bomb his position is that, "The neutron warhead is the most effective technological development available to meet the growth in Soviet armored strength without risking a major increase in civil destruction. The special characteristics of the neutron warhead would increase deterrence in Europe by improving the credibility of an effective NATO counter to Soviet military power. Such an increase in the credibility of deterrence would diminish the prospect that war would ever break out in Europe."

There is a comment by Anderson that may perhaps be set in opposition to these Reagan positions: "We must use our heads when we purchase high technology weapons systems. In the past we have brought many weapons systems that were so sophisticated that they priced us out

of the national security market place. Each unit became so expensive that we could afford to buy only a few of them. Our defense dollar, therefore, bought far less defense than could have been bought had we purchased a much larger number of somewhat less sophisticated weapons."

Defense spending: An agreement between President Carter and our NATO allies specifies that our defense spending will rise by at least 3 percent (above inflation) over each of the next five years. Many Congressional hawks would like to see this amount increased to 5 percent or more. Carter's response has been to finesse the issue, submitting a 1981 defense budget calling for appropriations 5 percent above 1980 levels; deferral of some expenditures, however, will leave only a 3 percent increase in actual spending. The ploy has been successful for the time being, but leaves Carter's position on future defense budgets unclear.

Reagan, as is usual for non-incumbents, has not expressed his position quantitatively. His general position is that,



"One of the strongest guarantors of national security is a superior military defense. Yet only recently has the Carter administration seemed to recognize this fact, and then only in the context of its public relations effort to sell SALT II. We must reverse the decline in our military strength, and ensure that our nation has a superior defensive capability. This does not mean that we should blindly or extravagantly increase defense spending every year. But we must conduct a comprehensive and on-going evaluation of our defense needs . . . and then spend what is necessary to preserve the peace."

'Weakening our economy through excessive defense spending is not in the long-range interest of American security.' — John Anderson

Anderson, on the other hand, while no more inclined to name a specific figure than is Reagan, argues that his experience on the Joint Committee on Atomic Energy has enabled him to understand that, "weakening our economy through excessive defense spending is not in the long-range interests of American security." He continues, "I am not opposed to increasing defense spending to meet real needs—indeed I have supported an increased United States commitment to NATO—but we must also examine the contribution to our security of such alternative expenditures as energy research and development, energy conservation, materials research and development, space exploration, communications, and information processing."

One "real need" which Anderson sees is better pay and benefits for Armed Services personnel. Saying that he is "unalterably opposed to the draft during peacetime" (and alleging that, "President Carter's proposal to reinstitute registration for the draft is the first step towards peacetime conscription") Anderson nevertheless concedes that, "The all-volunteer forces, as currently maintained, are not adequate." The major problem, in his view, is personnel policies which do not effectively attract, retain, or utilize the best individuals. In particular he notes that the real pay (after inflation) of armed services personnel has fallen 25 percent over the past eight years. "Is it any wonder," he says, "that morale in the services is low and that retirement or resignation rates are high?"

Non-proliferation: Though being against proliferation would seem to be automatic, Reagan has not developed a formal position on the subject.

Carter stands on his record, which includes signing the Nuclear Non-Proliferation Act. This act requires that all nuclear activities of any nation receiving U.S. nuclear exports must be subject to International Atomic Energy Agency (IAEA) safeguards. (However, he has recently sought to waive the Act's provisions in order to continue shipments of fuel for an Indian reactor, though India has refused IAEA safeguards. While both a pre-existing agreement to provide the fuel, and the need to improve relations with India argue for the waiver, most experts—including the Nuclear Regulatory Commission—agree it would be a major step backwards on proliferation.)

Carter has also sought to minimize the potential for diversion of fissionable materials intended for peaceful purposes to nuclear weapons production. To this end he has announced that the United States will not proceed with reprocessing of spent fuel or with breeder reactor development. These actions will have little effect, however, unless other major suppliers of nuclear reactors and material do likewise. To date, Carter's efforts at persuasion, either through diplomatic channels or the International Nuclear Fuel Cycle Evaluation committee, as to the wisdom of this course have been largely unsuccessful.

Anderson's attempt to go beyond the incumbent's position appears somewhat vague. Perhaps the most concrete idea is his suggestion that, "Our definition of proliferation sensitive technologies should be reviewed to be certain that nonnuclear technology cannot be exported if that technology, when combined with nuclear technology, might lead to the further proliferation of nuclear weapons."

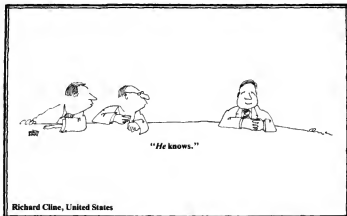
Anderson is specific, however,

about the "proliferation" of nuclear weapons in the hands of non-governmental groups. He says, "The threat of nuclear terrorism, while not especially high, is a threat that can no longer be ignored on the grounds of technical infeasibility." As a partial remedy he suggests that, "Those nuclear materials in metallic or non-metallic form that are directly usable in nuclear explosive devices should be banned from international commerce." (An Anderson spokesman points out that the fuel for high-temperature gas-cooled reactors, such as are being developed in Britain and Czechoslovakia, as well as for many university research reactors, can be readily fabricated into a device that will "go bang," though the yield may be less than a weapons-maker would regard as optimal.) Anderson also suggests that, "Materials readily convertible into nuclear materials suitable for terrorist use should be secured in the most rigorous manner possible," and, "Standards for the physical protection of nuclear materials in transit should be made as stringent as technologically feasible."

Nuclear energy: President Carter's position on nuclear energy may best be described as restrained. While this has disappointed those anti-nuclear activists who misinterpreted his 1976 campaign statement that "nuclear power is the alternative of last resort" as total support for their position, it has constituted an even more severe blow to those who favor a rapid expansion of nuclear power.

It is not often appreciated that when Carter withdrew his support for both breeder development and spent fuel reprocessing he was in effect declaring that nuclear fission is *not* the prime energy source for the twenty-first century and beyond.

When Carter withdrew his support for the breeder and spent fuel reprocessing he was in effect declaring that nuclear fission is not the prime energy source for the twenty-first century and beyond.



Rather, it is but a significant ingredient in a transition toward some other, as yet unspecified energy source. It is true that Carter has left open the possibility of developing a thorium breeder or advanced converter which could extend the nuclear option for several centuries, but he has notably failed to seek significant funding for any such reactor. It is also quite notable that—in striking contrast to Gerald Ford, for example—Carter has never sought any incentives for the construction of more nuclear plants. On the other hand Carter has sought to resolve the nuclear waste issue with the sort of “deliberate speed” that, by insuring all aspects are dealt with, appears likely to finally arrive at a solution which is both politically and scientifically acceptable. The effect will be to remove one of the most emotion-laden arguments against nuclear power. Ironically, this very deliberateness had been attacked by the nuclear power industry and welcomed by many anti-nuclear groups.

The adjective “restrained” might also describe Anderson’s position.

“During my tenure in Congress . . . I supported the development of the

nuclear industry, and I remain committed to preserving nuclear power as an option in the decade ahead. Unless, however, we can achieve and maintain adequate safeguards for the operation of reactors and the management of nuclear wastes, the further expansion of nuclear power must be halted.”

He then continues with a list of ten specific proposals intended to bring all nuclear reactors, including those already in operation, into compliance with the most strict safety standards, and to tie further expansion of the nuclear industry to development of both temporary and permanent waste disposal methods. He concludes, “The actions that I have endorsed are not designed to ‘pull the plug’ on nuclear power, but rather are crafted so as to prevent the further expansion of nuclear power unless there are adequate assurances regarding the safety of nuclear reactors and the disposal of nuclear wastes.”

Reagan’s position on nuclear power is short on specifics but generally pro-nuclear in tone. This is perhaps best expressed in the paragraph, “Properly operated, nuclear

plants are among the safest means of energy production. We must ensure that nuclear power plants possess the utmost in protective measures, and operate within strict safety standards. But since such protective measures are available, this is no reason to deny ourselves this clean and economical source of electric power.”

Energy—other sources and conservation: “Energy policy” is a term with almost endless ramifications, from gasoline rationing to solar power satellites. It will therefore be possible only to give a general feeling for the major emphases of each candidate’s position.

Carter’s public pronouncements have emphasized coal as our major fuel for the next century. Since, however, the major immediate problem is not a shortage of energy as such, but of liquid fuels, the major practical thrust of his program has understandably been development of synfuels—either coal-derived or from such “unconventional” sources as oil shale and tar sands. The recently passed synfuels bill, sponsored by Carter, allocates \$14.5 billion over the next four years for this purpose, and sets a goal of 2 million barrels per year for 1992. Gasohol and other biomass-based fuels are also classified as synfuels, but only \$1.45 million is allocated for their development.

Carter has also been generally supportive of conservation measures. His (arguably belated) support for deregulation of domestic gas and oil prices is a case in point. The same is true for his unsuccessful attempt to impose an additional gasoline tax equivalent to 10 cents per barrel of imported oil. Tax credits and other incentives for insulation and similar conservation measures have likewise drawn Carter support.

Carter has clearly made a special effort in his 'balanced budget' revisions to protect science, especially basic research. Anderson goes well beyond this, . . .

Another Carter initiative is the proposed Energy Mobilization Board, authorized to see that high-priority energy projects move along expeditiously and are not hampered by excessive bureaucratic delays or stalling tactics. He has, however, maintained a low profile on the most controversial question concerning such a board: whether it should have the authority to actually override environmental laws and regulations.

Carter's support for solar and other "soft path" technologies has been rather low key. As exemplified by the gasohol section of the synfuels bill, proposed funding levels—while not insignificant—are far less than those for other technologies, and also well below what advocates of soft path technologies believe could be effectively used.

Anderson's energy program is perhaps broadly similar to Carter's, though differences in emphasis are readily apparent. One is that Anderson wants to go further, faster in meeting our immediate needs through energy conservation. The prime example, of course, is his proposed 50 cents per gallon (perhaps later \$1.00 per gallon) gasoline tax, to be offset by Social Security tax reductions. He also favors liberalization of existing tax credits for residential insulation and weatherization, though cautioning that, "we cannot permit a wave of consumer demand to overwhelm the existing supply of home insulation services and thereby escalate insulation costs to unacceptable levels." Anderson was also one of the few Congressmen to support the President's call for standby gasoline rationing authority, and has argued that major portions of the revenue from the windfall profits tax should be set aside for mass transit. On the other hand, Anderson warns that the President's call for a mandatory 50 per-

cent reduction in utility company oil usage may be economically unrealistic, and will in any case require a far larger federal subsidy than the proposed \$5 billion if utility customers of New England and the West Coast are not to bear a disproportionate share of the burden.

He likewise appears to place greater emphasis on alternative energy sources—though, as is often the case when comparing a challenger to an incumbent, the differences might be as much in rhetoric as in actual policy. Nevertheless Anderson specifically makes that point that, "merely because an energy source does not fit our traditional fossil fuel-oriented conceptions of energy, it does not mean we should ignore its potential."

In concrete terms, he not only supports Carter's proposed Solar Bank to finance the purchase and installation of approved home solar energy systems, he also suggests that the proposed funding of \$150 million per year, "may prove inadequate to satisfy consumer demand"; the implication is that he would propose additional funding. Anderson likewise supports Regional Energy Banks, operated and funded by groups of states, which support energy technologies appropriate only to specific regions. (Wood stoves, for example, are attractive alternatives in rural New England, absurd on the Great Plains.) He would also like to see the windfall profits tax used to expand federal research on solar, wind, tidal, biomass, peat, geothermal, and nuclear fusion technologies. Nuclear fusion draws particular enthusiasm and a specific proposal for a 50 percent increase in funding, from \$500 to \$750 million per year. This would, he says, help bring fusion technology to commercial feasibility before the present Department of Energy target date of 2020.

None of this should be taken to mean that Anderson is opposed to coal and synfuels development. If Anderson's enthusiasm appears less than Carter's, it is only by comparison with the greater emphasis he put elsewhere. His approach to synfuel development, however, differs from Carter's in precisely the way that might be expected from an individual whose stance on economic issues has been generally conservative. As he puts it, "We cannot entrust critical energy decisions regarding highly speculative technologies to the same category of people that run the Department of Energy." Therefore, rather than supporting the federal Synthetic Fuels Corp. of the Carter bill, Anderson would restrict the federal role to providing a guaranteed market for synthetic fuels, and perhaps a limited number of loan guarantees and accelerated tax write-offs for demonstration plants. Thus, "the risks, the costs, and the decision making [will] be left to the private sector."

Similarly, Anderson supports not only oil price deregulation, but an end to the system of gasoline allocation which he blames for the gas lines of 1979. He was also an early supporter of the Energy Mobilization Board, but has opposed giving it authority to override environmental regulations.

Reagan, in contrast to both Carter and Anderson, places primary emphasis on increased production of domestic oil and gas, as encouraged by elimination of allocation formulas and oil price controls—without a windfall profits tax—and reduction of the capital gains tax to encourage private energy investment. He also calls for increased use of coal, pointing to technological solutions to both air pollution and land-use problems. This leads him to support expanded leasing of federal coal-bearing lands; in his words, "there is

... with a science platform that could easily have been a 'wish list' for university research administrators. Reagan has not presented a policy position on science and technology.

no reason to allow unnecessarily restrictive federal rules to deprive the American people of this valuable energy source."

With regard to alternative energy sources, Reagan's position is that, "We should encourage these developments in the industrial and educational communities by eliminating unnecessary federal roadblocks, while at the same time avoiding costly and unproductive federal development schemes that would sap limited financial and human resources." These would appear to imply a policy of benign neglect for which few believe alternative technologies are yet ready.

Science policy: Throughout his presidency Carter has supported an expansion—in real, uninflated terms—of funds for both research and development in general and basic research in particular. While

the expansion is certainly made easier by the low levels to which funding had fallen under the Nixon administration, it must be recognized that Carter is the first President in history to specifically encourage basic research as such. It must also be recognized that in previous budget crunches science funding has been treated as a "controllable expense," and often as a prime target for cuts. By contrast, Carter has clearly made a special effort in his "balanced budget" revisions to protect science, and especially basic research, as much as possible.

Anderson goes well beyond this, with a science platform which could easily have been a "wish list" for university research administrators. He pledges he will, "move to establish stable and predictable funding levels for research, so that scientists can plan long-term proj-

ects with confidence," and specifically calls for returning research and development funding, in uninflated dollars, to 1965 levels—some 20 percent above current amounts. He also calls for reducing the, "federal rules, controls, regulations, and paperwork," which he believes are stifling the relationship between government and the universities. Other Anderson science planks are programs to re-equip government, university, and non-profit research laboratories, and extension of the investment tax credit to cover research and development performed in the private sector.

Reagan has not presented a policy position on science and technology.

So there they are, the platforms of the three major candidates. Which will best serve the country's interests? That's your decision, and mine, and the American people's. □

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What are the real threats to national security and survival, not only of the United States but of the Soviet Union as well?

CHARLES W. YOST

National security revisited

The political campaign of 1980 has been distinguished once again by one of our misleading debates on "national security." In these debates it is assumed, first, that the threat to our security is almost entirely military and can be sufficiently met by a military response and, second, within that fictitiously narrow compass, that the military power of the United States is dangerously flawed unless it is "superior" to that of our principal adversary. Both these assumptions are false, the first because it is insensitive to real non-military problems, the second because it is panic-stricken about unreal dangers.

More than two millennia ago Euripides spoke of the state of mind which has always been a principal cause of war: "The fear that comes when reason goes." Let us apply a little reason to the assumption that the inadequacy of certain critical elements of our military defense will allow the Soviets either to launch a major attack upon us, or to pick off and occupy strategic areas in the Third World, or to impose political submission on us or our allies by nuclear blackmail.

The much discussed probability of a first strike against our land-based ICBMs, which could become vulnerable to such a strike within the next few years, is a delusion of armchair strategists. The United States has over the past three decades, with enormous effort and cost, built up a triad of strategic nuclear systems, precisely because of the recognition that one might eventually become vulnerable. The other two—that large proportion of our submarine

fleet which is always at sea and that proportion of our bomber fleet which is always on the alert and able to take the air in a few minutes—are invulnerable to a first strike. Both are currently being strengthened, the former by the addition of Trident submarines with longer range missiles, the latter by the addition of cruise missiles. However, even without these additions, those invulnerable elements of our strategic deterrent would be sufficient to wreak enormous devastation on the Soviet Union, wiping out most of its principal cities and most of the great industrial plant which it has built and rebuilt at such heavy sacrifice over the past half century. It seems very probable that the Soviet system (or indeed any other) could not survive such devastation.

Some American proponents of the scenario of a Soviet first strike on our land-based missiles maintain that an American President would not dare retaliate with our submarines and bombers for fear this would provoke a Soviet second strike on our cities. This contention seems to me to misread the psychology of any American President I have ever known. After all, what were the other two legs of the triad constructed for? Could any President passively ignore, fail to respond to, a massive attack upon us? Did not Truman, even when we were winning, feel he had no choice but to use the atom bomb? The decisive point, however, is that Soviet leaders would not *know* what an American President would do in these circumstances. Indeed, the Soviets would be likely to assume, on the basis of

their own psychology, that he *would* retaliate.

Unlike the United States, the Soviet Union has been twice occupied and devastated in this century. During the last invasion, as every Russian is acutely aware, they lost 20 million people. Their leaders are also fully aware what a nuclear war would mean, demographically, economically and politically. Khrushchev said that in such a war the living would envy the dead. He also said to Harold Macmillan that there would be many survivors—but most of them would be Chinese.

Under these circumstances, and with this awareness, the supposition that the Soviet leaders would intentionally launch a nuclear first strike is sheer nonsense. They are neither stupid nor crazy. They would not risk all they have striven for and created, not to mention their own power and their own skins, for the extremely problematical gains they might achieve by attacking the United States. Their "scientific" Marxist doctrine teaches them that eventual victory is inevitable. Why then run appalling and unnecessary risks? Russians, unlike Americans, are a patient people. They can wait.

These same arguments would apply to a massive calculated conventional attack in Europe. Soviet military doctrine holds that tactical nuclear weapons, which are strewn in enormous profusion across that front, would inevitably be used. It is indeed hard to imagine how such escalation could be avoided if the war lasted even a few days. Once the nuclear barrier was breached, the escalation would very probably ex-



tend to, first, the "gray areas" of intermediate nuclear weapons in and around Europe and, finally, strategic nuclear weapons. This probable chain reaction is perfectly obvious to the Soviets. Therefore, as long as NATO maintains a serious and credible defense along the Elbe line, including a nuclear defense comparable to what they have, the Soviets will be deterred from launching a massive attack in Europe.

The final fallback of the less unreasonable American proponents of the Soviet first-strike scenario is that it is very unlikely that the Soviets would actually launch a first strike against us. But given the fact that they had the capability to do so, and that one leg of our strategic triad was vulnerable, the Soviets would be able to successfully apply political blackmail to us or our allies either by overtly threatening to use their weapons if we did not comply with their demands or by simply posing their demands in the expectation that we—aware of their superiority and intimidated by it—would feel obliged to comply.

This scenario has always seemed to me fully as flimsy and implausible as that postulating an actual first strike. If the argument presented above is correct, and I am convinced it is, there exists no reason to succumb to political blackmail based either on the vulnerability of one leg of our strategic triad or on weaknesses of our conventional forces in Europe. An American President or allied head of government could simply respond in appropriate language to such a Soviet demand, with a reasonable assurance that the

threat, explicit or implicit, would never be carried out. An attempt at nuclear blackmail would be an empty gesture and, knowing it to be so, the Kremlin would be unlikely to risk a contemptuous rebuff.

Having disposed of these fundamental misconceptions, which have beclouded and distorted our whole debate about an adequate national defense, we can turn to what actually should be done to correct real deficiencies and to overcome the growing impression at home and abroad that the Soviets are about to become "superior."

Perhaps the first and most important thing we could do would be to cut off the torrent of self-depreciation and self-flagellation which pours out of conservative think tanks, hard-line politicians and even, at budget time, the Pentagon. If we keep telling the rest of the world that we are militarily weak and are losing the will and ability to defend them, we should not be surprised if eventually some might come to believe us. The road to "Finlandization," if there ever is one, will be paved with U.S. professions of impotence.

As a matter of fact, the claims that the Soviets are or are becoming militarily superior in an overall sense are also without foundation. They are of course superior in some weapons, just as we are superior in others. But they are still laboring to catch up in MIRVed missiles and numbers of nuclear warheads when we are forging ahead on a more capable and invulnerable type of submarine and on a new weapon of awesome, and double-edged, potential-

ity—the cruise missile. In a few years our land-based missiles may be vulnerable but Soviet land-based missiles, which constitute a much larger proportion of their strategic arsenal, will be equally so.

Incidentally, the proposed U.S. MX missile—if we are ever foolish enough to proceed with it—would be the most expensive and useless boondoggle in our history. This is a weapon designed to meet a military and political threat which does not exist, a weapon which could cause far more devastation to its immediate environment than to a hypothetical enemy.

It is correctly claimed that the Soviets are spending more for defense than the United States. But it is overlooked that NATO as a whole is spending substantially more than the Warsaw Pact as a whole spends. And this comparison takes no account of the Chinese. Though they are certainly spending far more than I would consider necessary, the Soviets are still spending considerably less than all their adversaries taken together.

There are, however, serious deficiencies in the U.S. military posture which should and can be corrected, if we do not waste too much of the taxpayer's money on obsolete extravagances like the MX and giant aircraft carriers. Certainly our most serious deficiency is the quality of our military personnel, on which the effectiveness of all our weapons depends. The volunteer system has had the result of concentrating our recruitment principally among the least educated and least qualified sector of our population. Even those who have been taught skills during



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their military service are often lured away at the height of their usefulness by offers of higher pay from private industry. Much greater expenditures for military pay and benefits should have a far higher priority than the sophisticated "star-war" weapons which seem to have such an irresistible appeal to Pentagon planners and to members of Congress.

Moreover, a political party which insists on greatly augmented national defense, which demands military "superiority" over the Soviets, and yet adamantly opposes restoration of the draft (or even registration for it) is playing a hypocritical shell game with the American public. It may not be quite certain yet, but it is likely to become so soon, that an essential element of maintaining "essential equivalence" will be restoration of conscription.

What are the real military threats to security and survival, not only of the United States but of the Soviet Union as well? There are two which are serious. The first is the danger that a totally unrestrained arms race, particularly one featuring arms of untested but frightening capabilities (such as cruise missiles, laser weapons, satellite killers, or chemical and biological devices), will so elevate fears and tensions as to create on both sides a chronic state of paranoia and trepidation. Under the misapprehension that it is being or is about to be attacked, either side could launch a "response" which would itself initiate a nuclear exchange. Once one button at this level had been pushed, it would be almost impossible—in the irrational, panic-stricken atmosphere which would ensue—to prevent other buttons from being activated.

Thus the most immediate threat to our national security in the 1980s will not be Soviet ambitions or machinations but the exterminating Frankenstein which both sides have com-

pulsively built up over the past 30 years. As automation progresses, command and control of these Frankensteins becomes more and more precarious. A trillion dollar defense budget is more likely to aggravate than to assuage this danger. As Hannah Arendt pointed out some years ago, soldiers can no longer under modern conditions protect their civilian populations; they can only avenge them. Moreover, to emphasize the gravity of the problem, the unanimous conclusion of the speakers at a recent symposium at the Harvard Medical School was that no adequate medical response would be possible even in the event of a "limited" nuclear exchange. Civil defense plans are nothing more than a dangerous illusion. And in a nuclear attack on Boston, for example, everyone and everything within a 6-mile radius would be destroyed instantly and half the people within a 20-mile radius would be killed or injured.

A further ominous complication is the proliferation of nuclear weapons capabilities to governments in the Third World. As nuclear energy technology is more and more widely disseminated, these capabilities are bound to follow. As long as the great powers continue to deploy such weapons, it will not be possible to persuade other governments that their use is immoral or unprofitable. The probable prospect, therefore, is for a steady growth in the number of nations possessing a nuclear capability, and indeed for increasing access to weapons-grade nuclear materials by political factions and terrorist groups. The effect of such developments on the security of the world as a whole, and even on the national security of the great powers, can be well imagined.

Under all these circumstances the most urgent conceivable measure of national security would clearly be a

series of U.S.-Soviet arms control agreements which would reduce rather than increase the numbers of nuclear weapons on both sides, which would ban the development of new types of weapons and, most important of all, would calm the tempers and alleviate the tensions which could so suddenly and easily ignite into holocaust.

In recent testimony before a congressional committee, General Richard Ellis, Chief of the Strategic Air Command, said:

"The delay in ratification of SALT II promises to further aggravate the balance. . . . SALT II restraints would have placed a quantitative lid on on-going programs—even though qualitative improvements would have continued. With no SALT II, the Soviets have the option of pursuing both. . . . From a military and strategic balance point of view, the United States needed SALT II more than the Soviets and now our country must be prepared to meet the consequences of delayed or no ratification."

The suggestion that the United States can outspend the Soviets to achieve military "superiority" and force them to negotiate on our terms could only be made by those who have little understanding either of Soviet psychology or the Soviet political system. The Soviets simply will not accept U.S. military superiority. In theory the United States, having the more affluent and productive economy, should be able to spend more for defense. Political realism, however, suggests the contrary. Under the American democratic system, popular pressures for domestic programs, for balancing the budget, for cutting taxes, will prevent defense expenditures from rising above a certain level. Under the totalitarian controls exercised by the Soviet

The most immediate threat to our national security in the 1980s will not be Soviet ambitions or machinations but the exterminating Frankensteins that both sides have compulsively built up over the past 30 years.

system, their leaders will be able to extract from their compliant population whatever resources are necessary to maintain "essential equivalence" with the United States, no matter how great the sacrifices required.

The second immediate threat to our security arises from the not inconsiderable possibility that Soviet and U.S. involvement in competition and conflict in the Third World might—without either superpower intending or desiring such an outcome—escalate into a direct confrontation between them and general war. Shortly before leaving office, Henry Kissinger said that should World War III ever occur, it would not be (like World War II) because one side intentionally started the war, but (as in the prelude to World War I) because both sides allowed themselves to be drawn progressively into a series of "defensive" steps which, cumulatively, made war inevitable.

It does not take a very active imagination to envisage a scenario around the Persian Gulf, or in any one of several other trouble spots in

the Third World, in which rival governments or political factions would appeal to the superpowers for assistance. The assistance once granted then escalates from the supply of arms to the supply of troops. Temper on both sides rise to a high pitch because each would fear that it was about to be outmatched and humiliated. Stakes are raised passionately and imprudently on both sides, and eventually, without either having intended or desired it, they find themselves at war with each other.

Since turbulence and conflict are certain to continue and probably to increase in many parts of the Third World in the coming years, since with the growing economic and political interdependence of all nations the great powers are likely to find or to claim vital interests in many of these conflicts, and since once involved in them the course of events will often be determined not by the remote patron but by the impassioned client on the spot, this scenario is not an implausible one. It represents, in my view, the second most real and immediate threat to our national security.

Just as the first threat—that of fears and tensions caused by competition in weapons—cannot be removed by doubling or quadrupling the number of weapons, so the threat of superpower competition in the Third World cannot be removed by doubling or quadrupling our military presence in the Third World. It is unfortunately the case that a U.S. presence will have to be somewhat augmented in order to convince the Soviets that they cannot with impunity use military force to extend their power in the Third World. Power—whether in Angola, Ethiopia, Afghanistan or elsewhere—will not be any more enduring in the longer run than it once was in China, Ghana, Indonesia and Egypt. But the easy exercise of power does for the time being create tempting illusions which should be dissipated before they become more dangerous than they already are.

In performing this necessary task, however, the United States should be careful to avoid succumbing to the same illusions the Soviets have: that it can establish a permanent dominant position for itself in some Third World countries, that it can effectively and usefully involve itself in civil wars, that propping up friendly dictators who may be on the verge of losing the "mandate of heaven" can in the longer run be other than disastrous. One way of mitigating some of these hazards would be to persuade some of our allies, primarily the British and French, to assume some of these burdens and thus to diminish the impression of superpower intervention and polarization.

An even more useful measure (if it should ever become practicable) would be a military non-intervention pact, a self-denying ordinance, between the United States and the Soviet Union, by which both would undertake *not* to send military forces

"Only one fool . . ."

"How do we avert a nuclear holocaust?"

As Nigel Calder said, 'It only needs one madman, or one fool who misunderstands a crisis, to bring northern civilization to an abrupt end.' There will be no winners of a nuclear war. We ask all the governments of the world to begin to work again for arms limitation that can and will lead to the reduction and eventual dismantling of all stockpiles of nuclear weapons.'

This statement was signed by 320 scientists attending the 20th International Conference on High Energy Physics in Madison, Wisconsin, in July 1980. Sponsors of the statement include Nina Byers, Maurice Goldhaber, Robert Hofstadter, Henry Kendall, Vera Kistiakowsky, Robert March, and Abdus Salam.

The 1980s will see either a drastic reordering of man's fundamental priorities or a significant decline in man's ability to cope with the real world.

of any kind, including allied forces, into Third World countries—even if such forces were requested by the governments of those countries or by "freedom fighters" struggling to overthrow governments. In order not to attempt too much at once, arms and economic aid might be permitted under such a pact, but not combat forces. Civil wars, insofar as outside intervention was called for, would be the exclusive responsibility of regional organizations and the United Nations. It is most unlikely that the Soviet Union is ready for such a pact at the present time. It is entirely possible, however, that the force of circumstances might induce it to reconsider before too many years have passed. In any case the United States would be well advised to put such a proposal forward promptly and to seek the widest possible Third World support for it.

* * *

Contrary to the apocalyptic nightmares of those who can see nothing on the map but the Soviet Union, military hazards of any kind are in this modern age far from being the only, or even the most serious, threat to our national security. Others of even more disturbing magnitude were presented in a report released last July, drafted by the Council on Environmental Quality and the State Department, entitled, "The Global 2000 Report to the President."

"Barring revolutionary advances in technology," the report asserts, "life for most people on Earth will be more precarious in 2000 than it is now—unless the nations of the world act decisively to alter current trends." The report proceeds to document this statement in the three fields which its authors were charged to investigate: population, resources and environment. Among its findings were the following.

• Unless current trends are arrested, world population, now more

than 4 billion, will increase 50 percent by the year 2000, and will continue growing to 8, 10, 12 or 15 billion thereafter. Obviously such vertiginous growth in numbers would enormously aggravate all other national and international problems, would constitute a steadily increasing strain on non-renewable energy resources and arable land, and would sharpen tensions and conflicts in and among Third World countries which may well involve the superpowers and constitute the main threat to world peace.

• As to natural resources, there will be by 2000 an increase of only 4 percent in the arable land required to feed these expanding populations. Most of the increased output in food will have to come from increased yields, which are dependent on fertilizers, pesticides, power for irrigation and machinery, for which in turn oil and gas, now subject to dwindling supply and rising prices, are required.

• Global requirements for water will double by 2000 and it too will become much more costly.

• Some 40 percent of the remaining forest cover in developing countries is likely to disappear by 2000. Needless to say, forests are essential not only for fuel and timber but for sustaining water supplies and arresting desertification.

By the year 2000, therefore, pressures for basic human needs for food, air, water, energy and space are likely to be overwhelming. Those who now advocate the expenditure for national security of an additional \$20 billion each year for the next five would do well to give serious thought to the likelihood that expenditure of some substantial proportion of this amount for the purposes described in this report would do far more for real national security than would their exclusive concentration on often hypothetical military needs.

Matina Horner, President of Radcliffe College, has remarked that "the 1980s is certainly going to be an age of second thoughts." I would maintain that decade will be either one of a drastic reordering of man's fundamental priorities or one marking a significant decline in his ability to cope with the real world. □



"Did I have a nightmare last night! I dreamed they had a billion missiles and we had only a million."

Ross, United States

Not until NATO announced its decision last December to introduce new U.S. long-range missiles into Europe did the public realize what the flexible, low-yield and highly accurate Pershing II missile would mean for war-fighting.

CHRISTOPHER PAINE

Pershing II: the Army's strategic weapon

For believers in nuclear arms control the last few months have had a nightmarish quality—as though the dykes were suddenly collapsing all around and the deluge engulfing us from all directions:

- the NATO decision to introduce intermediate range nuclear missiles (the Pershing II) and ground-launched cruise missiles (GLCM) to match "modernization" of the Soviet IRBM force with the mobile SS-20;

- the collapse of SALT II;

- the imminent deployment of the U.S. counterforce-capable MX missile in a provocative multiple-shelter mode, with a new limited nuclear doctrine to match;

- the upgrading by the Soviets of their first-strike threatening SS-18 and -19 rocket forces; and

- the general deterioration of Soviet-American relations.

In view of all these developments, the Bulletin will, in the next months, try to reassess the status of the U.S.-Soviet nuclear arms race, and its implications for the future of this threatening confrontation. We shall try to elucidate the implications of this arms race on the security of all the nations involved, particularly for those nations—like the European allies of the two superpowers—that find themselves embroiled in a deadly competition over which they have neither control nor clear avenues of escape. The smaller actors, however, perhaps much more than they realize, could assume a key role in guiding or deflecting the motions of the two giants into more constructive directions.

This is a prospect that we believe merits serious exploration in the pages of the Bulletin.

—THE EDITORS

Ever since 1956, when then Secretary of Defense Charles "Engine Charlie" Wilson restricted the Army's offensive nuclear role to short-range systems, the service has never quite been reconciled to being excluded from strategic offensive warfare. So in recent months, unnoticed by almost everyone, the Army has quietly obtained what amounts to a reversal of Engine Charlie's landmark ruling, which had confined competition for strategic missiles and budgets to the Air Force and Navy. With the planned 1983 deployment in West Germany of the extended range Pershing II mobile ballistic missile, now in an "accelerated" full-scale engineering development program, the U.S.

Army will once again acquire the capability to attack military targets in the Soviet Union, this time with astonishing swiftness and accuracy. The Pershing II, in fact, is currently the most accurate ballistic missile system in the world.

First deployed in Europe in 1962 to provide medium-range nuclear support to NATO forces, the original Pershing was a mobile system with a large 60- to 400-kiloton warhead and a range of 100 to 400 nautical miles.

Martin Marietta's Orlando Division, the original Pershing contractor, received a sole source "follow-on" contract to develop second generation ground support equipment to increase the system's ability to—in the words of Colonel

Samuel Skemp, Pershing I-A project manager in the early 1970s—"move, shoot and communicate."

Deployment in Europe of the improved system, designated Pershing I-A, was carried out from 1969 to 1971. Since then Pershing I-A has itself undergone a series of improvements aimed at reducing the missile's "reaction time." An automatic reference system eliminates the requirement for launch from pre-selected and surveyed sites, while another device, known as a "sequential launch adapter," permits a Pershing platoon commander to count down and launch up to three missiles in rapid succession.

Even before these improvements had reached the field, the Army was devising a "requirement" and developing the technology for a successor system, Pershing II. The need for Pershing II, according to Army sources, derives from the shift in NATO's strategy during the late 1960s toward a capability for "flexible" nuclear response to an attack, since the Pershing's warhead was considered to be excessively large and destructive for battlefield use. According to Brig. General Lynwood B. Lennon, Deputy Director for Nuclear and Chemical Matters in the mid-1970s, the Army's "first interest" in developing the Pershing II "is a desire to be able to do a better, more efficient job of wrecking an enemy airfield without demolishing the town nearby."

In February 1969, Martin-Orlando received a six-month \$150,000 contract to study alternative methods of satisfying the need for a more "credible" theater nuclear interdiction



Christopher Paine is a Washington-based investigative reporter and a research associate of the Council on Economic Priorities where he is working on a study of the MX missile system.

capability. Not surprisingly, the study concluded that an upgraded Pershing type missile with a precision guided re-entry vehicle would be the most cost effective solution.

Six months later, working on "indirect" Bid and Proposal funding, the company followed up their study conclusions with a full-blown unsolicited proposal to the Army Missile Command for a terminal guidance development program for Pershing.

According to the Government Accounting Office, a February 1971 Army study echoed the Martin Marietta proposal, stating that improved accuracy for Pershing, coupled with a low-yield earth penetrating nuclear warhead, would enable the missile to be considered for "selective use" against hardened targets rather than for mass destruction. In May 1971, the Army Missile Command awarded Martin Marietta a sole source \$500,000 contract for preliminary design effort on the guidance system, and a \$5.5 million request for a project entitled "radar area correlation" appeared in the Army's FY 1972 research budget under the "Terminal Homing Systems" program element.

The "Pershing Alternatives Plan," a document prepared by the Pershing Project Office and approved by Army officials in October 1971, likewise endorsed development of a terminally guided reentry vehicle, "appropriate" conventional munitions, and the earth penetrating nuclear warhead. These improvements were also included in the Department of Defense budget guidance documents dated December 1971 and February 1972, but were not identified under a separate line item as a major system acquisition program.

Instead, the Army forged ahead in January 1972 with a two-year \$10.5 million sole source award to Martin

Marietta for advanced development of the new guidance system and preliminary work on the re-entry vehicle. Congress remained in the dark.

Five years after the program actually began, Pershing II finally appeared as a separate program element in the Army's FY 1975 budget request for advanced development of missiles and related equipment.

Congress supported the \$12 million request for continuing the development of the guidance system for FY 1975, but reduced the \$11 million request for the reentry vehicle to \$2 million because of doubts regarding the need for Pershing II in Europe and the possibility of sharing development costs with NATO nations. No such doubts afflicted the Army, however, which pushed ahead with the Pershing II program, awarding a \$19.8 million sole source contract to Martin Marietta in February 1974, well in advance of the Congressional appropriation for that year.

For the next three years, the Pershing II advanced development effort coasted along at \$25 to \$30 million per year. Bogged down in a host of problem-ridden conventional weapons modernization programs, the Army appeared to be losing interest in Pershing II. The Department of Defense, meanwhile, had begun a conceptual design effort for a brand new medium-range ballistic missile (MRBM), and the Air Force was pushing the ground-launched variant of General Dynamics' Tomahawk cruise missile.

In February 1979 Martin Marietta received a \$360 million contract for full-scale engineering development of Pershing II. The 56-month contract, second largest in the history of Martin's Orlando division, is still only the prelude to a production decision. That was again postponed, not as a result of doubts about the need for "modernized" theater nu-

clear forces, but rather because the precise "mix" with the Tomahawk cruise missile had not been determined. As a result of the December 1979 NATO decision to modernize its theater nuclear forces, it now appears that both systems will enter production.

Total projected research, development, test and evaluation costs for the Pershing II are expected to be roughly \$700 million by the time the system begins production in FY 1983. Pershing II procurement is estimated at \$900 million, but as one industry source observes, both these numbers "can be expected to escalate somewhat with inflation." By the late 1980s, then, Martin-Orlando will have received a minimum of \$3.5 billion for versions I, I-A, and II; and a Pershing "II-A" or "III" is reportedly already on the drawing boards.

Although Pershing II has been under development for almost ten years, most Americans—indeed, most legislators—did not become aware of the system until a few months prior to NATO's December 1979 decision. The Carter administration claims that both the Pershing II and the cruise missile are necessary responses to Soviet deployment of the SS-20 mobile ballistic missile in the western Soviet Union and continued production of the medium-range Backfire bomber. (See table for comparison of some of the characteristics of the systems in question.)

The Carter administration's justification for Pershing II is deficient in at least two respects. First, the missile cannot possibly be explained simply as a response to the SS-20 because it began as an evolutionary improvement to an existing short-range (400 nautical mile) system long before the Pentagon had ever heard of the SS-20. Second, a comparison of the missiles'

Along with its accuracy and warheads, another extraordinary aspect of the Pershing II is its range. It keeps growing.



U.S.-Soviet Modernization of European Missiles*

	U.S. SYSTEMS			SOVIET SYSTEMS		
	<i>Pershing I</i>	<i>Pershing IA</i>	<i>Pershing II</i>	<i>SS-4</i>	<i>SS-5</i>	<i>SS-20</i>
First deployed	1962-64	1969-71	(1983-?)	1959	1961	1977
Range (in nautical miles)	100-400	100-400	1,000-2,000	1,000	2,000	2,000-2,400
Circular error probable (in feet)	1,200	1,200	120	6,000-12,000	6,000	1,500
Warhead	Single, 60-400 kilotons	Single, 60-400 kilotons	Single, low (1-10) kiloton	Single, 1 megaton	Single, 1 megaton	3 MIRV, 1 kiloton each
Potential collateral damage	Moderate-extensive	Moderate-extensive	Very limited	Massive	Massive	Moderate
Kill probability against 1,000 pounds per square inch	.15-.43	.15-.43	.99	.01	.04	.17
Fuel ^b	Solid	Solid	Solid	Nonstorable liquid	Storable liquid	Solid
Reaction time ^{b, c}	Moderate	Good	Excellent	Very poor	Moderate	Good
Mobility ^c	Moderate	Good	Excellent	Fixed	Fixed	Good-excellent
Number deployed	(108)	108 (1 with improved ground support)	(108) (planned as replacements)	(500) (100 now retired)	100	100 (more planned replacements)

*Only the medium- and intermediate-range missile systems currently being updated on the two sides are shown. In addition, the United States had about 150 intermediate-range Thor and Jupiter missiles deployed in the United Kingdom, Italy, and Turkey between 1960 and 1963. When these were withdrawn, they were not replaced by another intermediate-range land-based U.S. missile, although their role was subsequently taken over by British and French strategic submarines, French land-based missiles, and U.S. Europe-assigned Poseidon submarines.

^bThe nonstorable liquid fuel of the SS-4 missile, which must be fed in shortly before launch, accounts for its very poor reaction time.

^cGood reaction time and mobility are the main factors in survivability—the ability to survive a preemptive attack from the other side and threaten a retaliatory strike.

The Soviets have no land-based systems outside the Soviet Union capable of reaching the United States. And in their view, the NATO decision...

capabilities reveals that they are designed to accomplish radically different objectives.

The Soviets are not replacing their older SS-4 and -5 missiles with the SS-20 on a one-for-one basis. By the mid-1980s, according to Pentagon sources, barring any successful effort to negotiate new limits on theater weapons, the current Soviet force of some 450 medium-range missiles will be replaced by a maximum of some 200 SS-20s. Although the new mobile missile is *improved*, the number of warheads targeted on Western Europe will not increase beyond the 600 carried on the older generation of missiles.

According to James P. Wade, Assistant to the Secretary of Defense for Atomic Energy, the SS-20 gives the Soviets "an option in reference to escalation control that we need to address." With its present estimated "circular error probable" (CEP) of 1,500 feet, the SS-20 has a negligible hard target kill capability. If the Soviets manage to retrofit a new guidance system which would reduce the CEP by more than half—to 600 feet, for example—the single shot kill probability against a target hardened to 1,000 pounds per square inch would increase to .70, giving the missile some counterforce capability, but still considerably less than the U.S. capability with Pershing.

Furthermore, the still large collateral damage arising from the detonation of a 150-kiloton warhead would appear to limit preemptive "first use" of the SS-20 in support of a conventional military attack upon NATO. It is likely the Soviets would risk inflicting such damage *only* in retaliation for nuclear attacks on themselves or their allies. Even then, the rationality of such a response is open to question, as it only invites further retaliation by other NATO nuclear forces not destroyed in the first round. In short, the SS-20

does not provide the Soviets with a "credible" option to escalate to theater nuclear strikes in support of their conventional forces. Even if one granted the credibility of the Pentagon's SS-20 escalatory scenario, NATO *already* has an even more survivable, equally numerous, comparably accurate, and lower yield (40- and 100-kiloton) capability in its submarine-based forces.

In all likelihood, what the Pentagon fears about the SS-20 is not its escalation potential, but its survivability. Unlike the older fixed site SS-4s and -5s—the former requires non-storable liquid fuel to be pumped in prior to launch and both are vulnerable to preemptive attack—the SS-20 appears likely to endure as a deterrent to NATO's "flexible response" escalation to "theater-wide nuclear interdiction" of Warsaw Pact forces and supply lines. As a glance at Pershing II's key characteristics suggests, its capabilities for "controlled escalation," "collateral damage limitation," and "hard target kill,"—the buzz words of NATO's flexible response strategy—greatly exceed those of the SS-20. In fact, Pershing's development history reveals little if any connection with Soviet nuclear capabilities, but does show strong links with the evolution of NATO's controversial strategy of controlled escalation to deter a conventional attack.

Just how accurate is the Pershing II? Published estimates in the aerospace trade press range from a low circular error probable (the radius of a circle within which half of the warheads fired at a target might be expected to fall) of 33 feet to a high of 120 feet. For a 99 percent kill probability on a target hardened to 1,000 pounds per square inch, this range of accuracy would require warheads ranging from roughly 1 to 9 kilotons, as opposed to the 60- to 400-kiloton

warheads now atop the Pershing I-A. This low range of yields theoretically could be even further reduced by taking advantage of the enhanced "cratering" and ground shock effects obtainable with the earth penetrator warhead.

A 5-kiloton earth penetrator would produce effects similar to those of a 100-kiloton surface burst weapon—a crater with an "apparent radius" of 317 feet and a depth of 106 feet. Assuming a circular error probable of 120 feet, this option likewise yields a 99 percent probability of kill at 1,000 pounds per square inch. The contrast with the present and probable future performance characteristics of the SS-20 is immediately obvious and should not be ignored when evaluating Pentagon claims about the Soviet "nuclear warfighting" threat.

Along with its accuracy and warheads, the third extraordinary aspect of the Pershing II is its range. It keeps growing. When the Pershing II program was first presented to Congress during hearings on the FY 1975 budget, no mention was made of any increase in the existing 400-mile range. The program was presented as a modular "improvement" to the existing Pershing I-A.

During Senate hearings on the FY 1978 budget three years later, Pershing project manager Hunt reiterated that "there is no change in the range. I want to point out that although a significant extension of the range is feasible, well beyond 400 nautical miles, by using higher thrust propellants, a conscious decision was made to retain the 400-mile range." This particular range, Hunt noted, "avoids the political implications inherent in a longer range system which can strike targets in the Soviet Union."

Repeatedly reassured that the Army was not building a new strategic weapon, the Congress

... to deploy new U.S. theater nuclear missiles in Europe simply increases the number of U.S. missiles capable of hitting the Soviet Union.

The Pershing II

'The most accurate ballistic missile system in the world.'

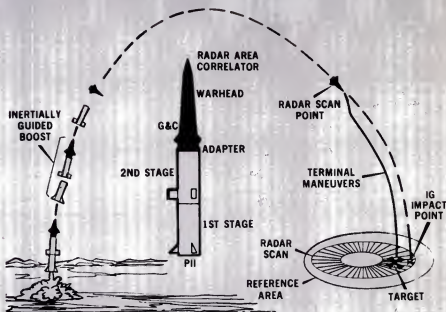


Diagram illustrating the trajectory and maneuvering capability of the U.S. Army's Pershing II mobile nuclear ballistic missile. The phenomenal accuracy of the Pershing,

according to top Army officials, enables the nuclear yield of the warhead to be reduced "so as to destroy little else beside the target."

The correlatron. The heart of the Pershing II system is a new terminally guided reentry vehicle incorporating a device called a "correlatron." Developed initially by the Goodyear Aerospace Corporation on "indirect" Independent Research and Development Funding, the correlatron is an outgrowth of Goodyear's early work in the 1950s on terrain recognition guidance systems for the USAF/Martin Marietta Matador and Mace cruise missiles. A radar housed in the ceramic nose cone of the reentry vehicle scans the target area and generates images for comparison,

or "correlation," with a stored radar mosaic previously gathered by reconnaissance satellites, aircraft, or drones.

The difference between the real world view as the reentry vehicle descends and the stored reconnaissance imagery is detected by an electronic multiplier cell, whose signals are used to update the reentry vehicle's inertial guidance unit. This unit in turn transmits commands to hydraulic fins which steer the reentry vehicle toward its target. The Pershing II reentry vehicle reportedly can be programmed de-

liberately to overshoot its target to deceive defenses and then return under terminal guidance.

As the reentry vehicle descends below 50,000 feet, the radar antenna in its nose cone begins turning at 2 revolutions per second, scanning the target area in a circular pattern with a narrow beam. Electronic jamming in the target area can reportedly cloud only a portion of the scan image, leaving the correlatron with enough reference points to find the target.

—CHRISTOPHER PAINE

The deployment of such weapons as the Pershing II will heighten rather than lessen the danger of nuclear war . . .

hardly noticed that the February 1979 announcement of Pershing II full-scale development included news of an unspecified increase in range. The subsequent FY 1980 Arms Control Impact Statement for Long Range Theater Nuclear Missile Programs revealed a dramatic change. The Pershing II will be a "new missile" incorporating not just a new reentry vehicle but also "new first and second stage motors and an advanced propellant to attain a range of about (deleted) km."

Filling in the "deleted" is not difficult. In the fall of 1979, during debate leading up to the December NATO decision to deploy a mixed force of 108 Pershing IIs and 464 cruise missiles, the Pershing II's range was stated by NATO officials as 1,800 kilometers. As for a possible further increase in range, European aerospace industry sources report that the United States has briefed NATO leaders on a 4,000-kilometer version of the Pershing which would use a new inertial guidance system and a new warhead in a much lighter reentry vehicle. This version of the Pershing is reportedly a "prime candidate" for the U.S. Mobile Medium Range Ballistic Missile (MRBM) program, presently in a holding pattern pending theater nuclear arms control negotiations with Moscow.

Both extended range versions of the Pershing are in fact new strategic weapons. If deployed in West Germany as planned, they will be able to strike targets deep within western Soviet Union. The 1,800-kilometer version could strike as far north as Leningrad and as far east as Kiev. The 4,000-kilometer version could strike targets in the Moscow area and beyond.

The campaign to win NATO approval of the theater nuclear modernization plan was accompanied by the usual Pentagon blitz of charts and tables, this time purporting to

show the decisive margin of Soviet superiority in long-range theater nuclear forces. One series of Pentagon charts which received wide circulation immediately prior to the NATO decision was based on a comparison of NATO and Soviet *land-based* theater nuclear missiles. Excluded from the totals of European theater nuclear forces were: the British nuclear submarine force of 64 Polaris missiles currently being modified to carry six individually targetable 40-kiloton reentry vehicles; the French submarine-based force of 80 missiles equipped with 500-kiloton and one-megaton thermonuclear warheads and 3,000-kilometer range (a new generation under development will have a 4,000-kilometer range and multiple thermonuclear warheads) and five NATO-assigned U.S. Poseidon submarines, carrying a total of 80 missiles with 800 to 1,120 40-kiloton and 100-kiloton MIRVs.

The Soviets have no land-based systems outside the Soviet Union capable of reaching the United States. In their view, the NATO decision to deploy new U.S. theater nuclear missiles in Europe simply increases the number of U.S. missiles capable of hitting the Soviet Union, while leaving the Soviets without a comparable addition to their capability to strike the United States. This is not an unreasonable view. Like NATO's existing theater nuclear forces, Pershing II, the cruise missile, and an eventual new medium-range ballistic missile would be integrated with U.S. strategic forces in executing the Pentagon's "Single Integrated Operational Plan" for an all-out war with the Soviet Union. Even in the absence of such a doomsday linkage, the Soviets have every incentive to limit the deployment of weapons which increase the likelihood of nuclear escalation in the event of a crisis.

Although the older Pershing's

large warhead yields and relative inaccuracy never made it an especially credible escalatory option, NATO strategists apparently felt the Soviets would be deterred from responding with their theater nuclear missiles by the prospect of devastating retaliation by "superior" U.S. strategic forces. Furthermore, the older generation of Soviet missiles "took a long time to get started," according to one Pentagon official, and this made them vulnerable to preemptive attack by NATO's QRA (Quick Reaction Alert) forces.

In recent years, defense officials say, the situation has changed dramatically. The Soviets have built up their intercontinental forces to a position of rough equality with those of the United States. The latest worry of the Pentagon is that the Soviets might "come to believe—however incorrectly—that they could use or threaten to use their long-range theater nuclear forces in the expectation that the United States would be deterred from responding with its central systems."

The idea that an increment of U.S. strategic "superiority" provides the margin for deterrence of nuclear warfare in Europe is a curious notion indeed, revealing far more about how the Pentagon thinks about nuclear conflict than it does about what is needed to deter the Russians. Why is it assumed that a nuclear force has to be "superior" in order to deter?

Surely, "equivalent" or even "inferior" nuclear forces—if they can endure long enough to be launched—constitute a sufficient deterrent to a Soviet nuclear attack on Europe. But NATO's strategy of flexible response places some rather special demands on the conditions of deterrence. The Pentagon seeks to maintain a nuclear posture which will assure not only deterrence but also the freedom to escalate to a nuclear response with an "acceptable"

... by tempting decision-makers in a crisis
to pursue illusory nuclear 'options' when none, in fact, exist.

degree of risk. The Pentagon apparently would have us believe that previously the option of nuclear "first use" was afforded by U.S. strategic superiority, which implicitly assured either complete destruction of Soviet offensive nuclear capabilities or the limitation of damage to NATO allies to "tolerable" levels.

To be both politically credible as well as militarily useful, NATO's "first use" doctrine requires a force structure designed, in the first instance, for swift preemptive attack against Soviet nuclear systems to limit the possible Soviet response. A force structured for "second strike" retaliation against Soviet industry and infrastructure will not suffice.

Since U.S. and Soviet central systems are presumably stalemated and therefore will not be used, at least not right away, the Pentagon contends NATO theater nuclear forces would be free to "engage high priority, fixed or semi-fixed land based targets normally located well behind the Forward Edge of the Battle Area (FEBA)."

There are, obviously, some drastic deficiencies in this scenario. Why does the Pentagon assume that "modernized" NATO theater nuclear forces will deter Soviet use of their theater nuclear weapons, but that Soviet nuclear weapons will not deter NATO nuclear strikes to prevent the collapse of conventional defenses? It seems highly unlikely that the Soviets will sit idly by admiring the surgical precision with which NATO chops up their military capabilities.

This kind of attitude should give every European pause. First, one might ask, how about the ones that get away? Second, NATO's strategy of "flexible response" would appear to increase the probability that nuclear weapons will be used in a conflict by lowering the perceived con-

sequences to NATO of nuclear first use, and heightening the Soviets' expectation that their nuclear systems will be preemptively attacked, leading to an ill-considered haste—from the European point of view—to get those systems airborne.

Of the several possible Soviet responses to this situation—particularly the extreme vulnerability of their present SS-4/5 missile force—deployment of the less vulnerable SS-20 is not the unmitigated threat to European security that it has been made out to be. From the perspective of strategic stability, the Pentagon itself argues that a mobile survivable Soviet ICBM would be preferable to the continued deployment of vulnerable silo-based missiles. Why does the same argument not also apply to the SS-20?

Third, the Soviets can, after NATO has expended billions of dollars building up its limited nuclear warfare capabilities, simply refuse to play the game by adopting a clear declaratory policy that any nuclear attack upon itself or its Warsaw Pact allies will be met by a devastating

attack on European population and industry.

The possibility of such retaliation continues to exist *de facto*, regardless of declaratory policy, in the minds of most rational political leaders. Only the Pentagon's Nuclear Policy Planning Staff and their colleagues in NATO's High Level Group appear to have forgotten this elemental truth of the nuclear arms race, a truth which will render superfluous any size expenditure they care to make. Not only superfluous, but extraordinarily wasteful.

If waste were the only consequence, then perhaps theater nuclear force modernization might be considered tolerable as some sort of atavistic ritual essential to the preservation of the Western alliance. But the deployment of flexible, low yield, highly accurate nuclear weapons such as the Pershing II will heighten, rather than lessen, the danger of nuclear war, by tempting decision-makers in a crisis to pursue illusory nuclear "options" when none, in fact, exist. □

That 'new' Soviet missile—the SS-20

"If present U.S. intelligence estimates hold true, ... controversy could develop over an expected Soviet testing of a new intermediate-range ballistic missile to be targeted against China and Western Europe. One civilian analyst said recently that too much has been made of the SS-20, an IRBM that was used as the reason for NATO's decision last December to introduce new American long-range missiles into Europe.

"The SS-20 does not have the accuracy, range or yield," the analyst said recently, "that has been attributed to it publicly ... and its deployment has been slow, indicating

the Soviets have something better on the way."

A Pentagon official described the SS-20 in similar terms and added that he thought it was an attempt to put something quickly in position for possible use against the Chinese. The SS-20, he noted, consists of two stages of a longer-range mobile SS-16 ICBM that the Soviets agreed to discard under the SALT process.

When a "really new" Soviet ICBM appears, the Pentagon official added, "we will have some explaining to do to people who were convinced the SS-20 was really new."—Walter Pincus, *Washington Post*, June 26, 1980.

NATO's efforts to achieve a more stable balance of nuclear forces has convinced many in the West that negotiations to limit such forces should be undertaken as soon as possible. The authors argue that NATO should refuse to delay deployment of the Pershing II.

COIT DENNIS BLACKER and FAROOQ HUSSAIN

European theater nuclear forces

Whether and how to constrain through negotiations the deployment of nuclear and nuclear-capable systems in the European theater is a question that has bedeviled policymakers in the United States, the Soviet Union, and NATO Europe since the earliest days of SALT. The controversy has become, if anything, more intense in the last several years.

Recent and important changes in the European military environment—punctuated in part by the dramatic improvement in Soviet long-range theater nuclear capabilities—have convinced many in the West that negotiations to limit these and comparable NATO systems should be undertaken as soon as possible. In this analysis of the feasibility, desirability and possible implications of negotiations, long-range theater nuclear forces are defined as those NATO and Soviet weapon systems—nuclear and nuclear-capable—with ranges substantially in excess of what is required for battlefield use but less than what is deemed necessary for intercontinental missions: weapons systems with ranges between 500 and 2,000 miles.

For much of the SALT period, many proponents of arms control tended to regard the so-called Forward Based Systems in Europe as little more than a troublesome complication to the process by which the two superpowers sought to limit their central strategic nuclear weapons. Essentially, the term referred to those American nuclear-capable systems, based in Europe, with the potential to reach targets in

the Soviet Union. Included in this definition were the several squadrons of F-111 aircraft based in England, a significant portion of the F-4 Quick Reaction Alert aircraft deployed in Central Europe and Italy, and the A-6 and A-7 strike aircraft of the American attack carriers attached to the Second and Sixth Fleets. The Soviet Union, with no bases outside its homeland from which aircraft or surface-to-surface missiles could inflict damage on the United States, was able to portray the problem as one of American making.

The Forward Based Systems issue was first raised during the negotiation of SALT I, as Moscow sought unsuccessfully to have European-based nuclear-capable American aircraft counted as part of Washington's central strategic arsenal—and thereby subject to limitation. The Soviets returned to the theme in the initial stages of SALT II, but, at the time of the Vladivostok summit between Leonid Brezhnev and Gerald Ford in November 1974, they agreed, once again, to drop this demand.

In conceding, the Soviets made clear, however, their intention to raise the Forward Based Systems issue anew in SALT III. And, in fact, the United States achieved this "concession" only by acceding to the Soviet demand for a ceiling of 2,400 strategic nuclear delivery vehicles for each side, a figure the Americans regarded as excessively high.

The issue remained dormant for over two years, until Secretary of State Cyrus Vance's ill-fated mission

to Moscow in March 1977. The primary purpose of the Vance visit was to present the Carter administration's proposals for "comprehensive reductions" in the SALT ceilings. In rejecting these proposals, Soviet Foreign Minister Andrei Gromyko denounced them as prejudicial to Soviet security interests. He also threatened explicitly to renew Soviet demands with regard to Forward Based Systems unless the March proposals were withdrawn.¹ Faced with the possibility of a collapse in the SALT negotiations, the United States quickly retreated to the guidelines originally elaborated at Vladivostok. The Soviets, for their part, chose not to pursue the course threatened by Gromyko, and consideration of the problem was again deferred.

The SALT II Treaty is silent on this issue; only the Protocol to the Treaty, which bars the deployment of American ground- and sea-launched cruise missiles with ranges greater than 600 kilometers, addresses even a part of the problem. Whatever political value adheres to the constraints set forth in the Protocol, they are without practical effect as the agreement expires on December 31, 1981, several years before any such systems could be deployed in Europe.²

In addition to the American Forward Based Systems, there are French and British nuclear forces of intermediate range, both land- and sea-based, fully capable of striking the Soviet Union. Although frequently termed "gray area" systems, the description is slightly misleading, as both Paris and London



Bas, Greece

regard most of them to be central strategic, rather than theater weapons. Moreover, as the decision to employ these forces rests ultimately with French and British political authorities—and not with American decision-makers—they have been and continue to be excluded from the bilateral SALT process.

Throughout SALT the Soviet Union has sought to identify American Forward Based Systems in Europe as an integral part of the United States' strategic nuclear arsenal. Successive Administrations have resisted this interpretation, and American policy-makers, with the full support of the Federal Republic of Germany and the United Kingdom, continue to argue that U.S. nuclear-capable systems in Europe should be viewed as Washington's contribution to the theater nuclear component of the Atlantic Alliance.

Even though the Soviet Union maintains no "forward-based" theater nuclear systems capable of striking the continental United States, it has developed large and sophisticated theater and medium-range nuclear capabilities, able to inflict selective levels of damage against key counterforce and other targets in Europe. One consequence of Moscow's theater nuclear force deployments—and NATO's sensitivity to them—has been to draw attention to the distinct "imbalance" of long-range theater nuclear forces.

As the Soviet Union developed both the size and quality of its nuclear forces, to equal and in some areas exceed those of the United

States, European concerns over the credibility of Washington's guarantee were heightened. The willingness of the United States to invite its own destruction by responding at the strategic nuclear level to a limited Soviet nuclear strike against West Europe was called into question. The problem was further compounded by the apparent inability of NATO—because of perceived qualitative and quantitative inferiority in long-range theater nuclear forces—to respond to and hence deter such an attack without immediate recourse to Washington's central nuclear systems. While these problems were not in any sense new, the arrival of strategic parity, and the prospect of its institutionalization through the equal ceilings set for SALT II, served to refocus attention on the theater nuclear "balance" in Europe.

From the NATO perspective, the situation with regard to European theater nuclear forces is hardly reassuring. In 1977, the Soviet Union began deployment of the SS-20, a land-mobile ballistic missile of intermediate range, equipped with three independently targetable nuclear warheads. By 1980, 60 of these high-accuracy missiles were deployed within range of West Europe, in addition to a remaining force of roughly 500 SS-4s and SS-5s. The procurement of the Backfire B bomber, a weapons platform of undisputed utility against all of NATO Europe, has continued without interruption since the introduction of that system in the mid-1970s; as of early 1980, approximately 50 were deployed west of the Ural Mountains.

Other improvements in the Soviet Union's theater nuclear posture have been afforded by deployments of the nuclear-capable MiG-27 Flogger D, SU-17 Fitter C and SU-19 Fencer aircraft.¹

NATO, on the other hand, maintains no surface-to-surface missiles of medium or intermediate range. Of the Alliance's nuclear-capable aircraft, fewer than 200 are earmarked for long-range theater nuclear missions. The remainder of NATO's most capable nuclear weapons platforms—including the bulk of the American and NATO strike aircraft based in Central Europe, the carrier-borne aircraft of the American Second and Sixth Fleets, and the entire French nuclear force—are regarded for political and military reasons as less than fully appropriate for long-range theater use.⁴

For nearly two decades NATO's numerical inferiority in long-range theater nuclear systems has been counterbalanced by the assignment of several U.S. Polaris and later Poseidon submarines to the defense of Europe. While the number of submarines required is regarded as flexible, it is generally assumed that some 300 to 400 Poseidon warheads are available to the Supreme Allied Commander Europe (SACEUR) to assign to theater targets. Equally, the MIRV footprint of the Poseidon C3 submarine-launched ballistic missile is considered consistent with the assignment of these warheads to interdiction targets in East Europe and the western Soviet Union.⁵ Additionally, the British strategic nuclear force of four Polaris submarines is assigned to NATO, although Polaris



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targeting cannot easily be considered appropriate to contingencies in the European theater.

Initially, the assignment of the U.S. ballistic missile submarines to SACEUR provided a practical demonstration of the conceptual link between theater nuclear systems in Europe and the U.S. central strategic systems, and they remain valuable for this purpose. But since their use would probably have a "strategic" character, a gap is perceived at the "theater" level—a gap that has widened with the introduction of such Soviet weapon systems as the SS-20 and the Backfire bomber. These have the capacity to attack smaller numbers of selective target sets and thus to limit indiscriminate collateral damage to civilian population and industry.⁶

The problem for NATO, however, is not simply how to correct the numerical imbalance in long-range theater nuclear forces. An equally important issue is whether the creation of an approximate balance of forces at the "Eurostrategic" level would be regarded as contributing to or detracting from the security of NATO Europe. Conceivably the achievement of rough equivalence could serve to undermine further the credibility of the American guarantee by raising the perception that a theater nuclear exchange on the continent could be geographically limited, and that European members of NATO could somehow be defended without recourse to U.S. central strategic forces. In these circumstances, the very foundation of the Atlantic Alliance would be called into question.

At a meeting of the International Institute for Strategic Studies in October 1977, West German Chancellor Helmut Schmidt noted that the achievement of parity between the Soviet Union and the United States at the strategic level had magnified

the significance of the disparities between NATO and the Warsaw Pact in both conventional and nuclear weaponry. Without referring explicitly to the issue of theater nuclear weapons, Schmidt urged the attainment of a military balance in Europe, and advocated a renewed commitment to negotiations in order to achieve it. At the same time, he admitted, implicitly at least, that in the event of a failure to realize an equitable mutual and balanced force reduction agreement, the Alliance should be prepared to safeguard its security through the procurement of additional military capabilities; presumably that would include supplementary theater nuclear forces. He did not explore the potential impact of a "Eurostrategic" balance on the credibility of Washington's strategic commitment, other than to note that the American guarantee to Europe was no less vital or reliable in 1977 than it had been during the past 25 years.⁷

Having identified the problem of growing Soviet conventional and nuclear capabilities in Europe—including the perceived asymmetry with respect to theater nuclear forces—neither Chancellor Schmidt nor any other senior political authority within NATO seemed in 1977 to know how to redress the issue of nuclear disparities. Equally absent was the requisite political consensus within the Alliance to carry out prescriptive measures.

To help determine NATO's long-term requirements for theater nuclear forces, the Alliance's Nuclear Planning Group established in 1977 a High Level Group of senior experts from nuclear planning group countries. Their eventual recommendation, two years later, was for NATO to deploy a total of 572 additional long-range theater nuclear systems in Europe—108 Pershing II sur-

face-to-surface missiles and 464 ground-launched cruise missiles—all to be manned and operated by the United States.

The Pershing IIs, with ranges sufficient to reach targets in the western part of the Soviet Union, were to replace on a one-for-one basis the shorter-range Pershing IAs deployed in West Germany. The cruise missiles, with ranges up to 2,500 kilometers, were to be situated in the United Kingdom (160), Italy (112), West Germany (96), Belgium (48) and the Netherlands (48). The survivability of these systems was to be enhanced by upgrading their mobility and storing them in hardened shelters. The modernization plan was slated for review in early December 1979 by the Alliance's Military Committee and, one week later, by the North Atlantic Council.⁸

Reflecting the concerns voiced by Chancellor Schmidt as well as those expressed by others in the Alliance, NATO also established a Special Group on Arms Control and Related Matters to draw up detailed proposals for the possible limitation of theater nuclear systems. An arms control package was to be submitted to the Soviet Union immediately following the approval by the NATO Council of the High Level Group's modernization plan.⁹

President Brezhnev pre-empted NATO, however. He proposed immediate bilateral or multilateral negotiations to limit European theater nuclear forces, during an address in East Berlin on October 6, 1979, but only if the NATO countries rejected the recommendations contained in the report of the High Level Group. The Soviet leader alleged that a balance prevailed in Europe and that any additional NATO deployments would only serve to upset "the strategic situation" on the continent and undermine security.¹⁰

That the principal aims of the



Soviet arms control initiative were to derail NATO's modernization plan and to exacerbate tensions between the United States and its European allies (some of whom, most notably the Dutch and Belgians, were distinctly unenthusiastic about the deployment on their soil of long-range theater nuclear forces) soon became apparent, as Soviet leaders warned the West Europeans of the implications of a decision to accept Pershing II and ground-launched cruise missiles. Gromyko, during a visit to West Germany in late November, stated that if Moscow's initiative was rejected by NATO and the Pershing II and ground-launched cruise missiles were sanctioned by the Atlantic Council in December, "the basis for negotiations would be destroyed; it would cease to exist."¹¹ The Soviets did not make clear, however, whether a NATO decision to proceed with modernization, or the actual deployment of those systems (not scheduled to begin before 1983) would eliminate the possibility of negotiations.

Despite the Soviet Union's efforts, the defense and foreign ministers of NATO approved the High Level Group's recommendations on December 12, 1979. Although the vote was unanimous, the Dutch government declared that it would postpone a final decision on whether to accept its allotment of cruise missiles until 1981, in order to allow time for a negotiated agreement with the Soviet Union. The Belgian government also reserved the right for a period of six months to reconsider its commitment to deploy the missiles.¹² At the same time, the ministers authorized creation of a Special Group to facilitate consultations between the United States and NATO Europe on arms control issues. In addition, the Americans were authorized by their European allies to begin exploratory discussions with

the Soviet Union on the possible limitation and reduction of long-range theater nuclear weapons in the context of SALT III.

Two days later, NATO submitted a new set of proposals at the mutual force reduction negotiations in Vienna; among other points, the Alliance offered to withdraw 13,000 American troops from Central Europe in exchange for a Soviet withdrawal of 30,000. (This represented an abandonment of the 29,000-for-68,000 formula favored by NATO since the inception of the negotiations in October 1973.) The West also retracted its earlier offer—the so-called "Option III" plan—to remove from Central Europe 54 F-4 nuclear-capable aircraft and 36 Pershing IAs in exchange for a reduction of 1,700 Soviet tanks. Simultaneously, NATO announced the withdrawal of 1,000 tactical nuclear warheads from West Europe, with long-range theater nuclear force deployments to be accommodated within the reduced level.¹³

Four days after the NATO Council session, *Pravda* declared that as a result of the Alliance decision, the basis for negotiations had been destroyed and a "favorable situation for Europe passed up."¹⁴ Early in January 1980, following the Soviet invasion of Afghanistan and President Carter's response, Moscow reportedly rejected an American note of late December suggesting guidelines for the limitation of theater nuclear systems, including the SS-20 and the Backfire.¹⁵ In February, however, Gromyko was somewhat more conciliatory when he said that "detente is alive and well" in spite of a Carter administration effort to ring its death knell. He added that "all talks in the field of the arms race should be resumed and continued."¹⁶ The Political Consultative Committee of the Warsaw Pact,

meeting in Warsaw in mid-May, took much the same position, stressing that "Negotiations on medium-range nuclear missiles [in Europe] are possible," if NATO were to reverse its decision of the previous December.¹⁷

The NATO decision to procure 572 longer-range weapon systems was not directed at eliminating Soviet numerical superiority *per se*; nor was the action taken in order to induce Moscow to enter into arms control discussions on the issue. Rather, the announced objectives are to "modernize" NATO's theater nuclear capabilities and to seek, through negotiations, "a more stable overall nuclear balance at lower levels of nuclear weapons on both sides."

Aside from the issue of "stabilizing" the balance of theater nuclear forces in Europe, or of satisfying European concerns about the American nuclear guarantee, it is appropriate to look at the potential contribution of arms control in this area.

Here, we make the assumption that theater nuclear force negotiations can and will be convened. But at a minimum, the initiation of negotiations will require a general and sustained improvement in U.S.-Soviet relations and the eventual ratification of the SALT II Treaty by the Senate. It must also be assumed that the two sides will be able to devise a mutually acceptable definition of what theater nuclear forces are to be limited.

Should these obstacles be overcome and negotiations prove practicable, what is the likelihood that the NATO objective—a more "stable" balance of forces in Europe—can be achieved? It is important to bear in mind that the Soviet Union has expended considerable resources over the last decade to attain

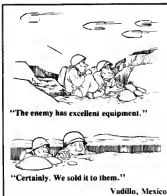
The effort to control long-range theater nuclear systems should be made, but it should also be recognized that security in Europe cannot be ensured through negotiations...

a posture at the theater nuclear level in Europe which, for whatever combination of political and military reasons, it regards as desirable for, if not essential to, its security. Having labored to achieve that relationship of forces, the Soviet Union will be disinclined to surrender that advantage through negotiations.

The NATO allies should also recognize that the Soviet Union is unlikely to undertake reductions which would seriously undercut the utility of its theater nuclear systems, except in exchange for sizeable cuts in NATO forces (which Alliance authorities would regard as destabilizing) and/or the inclusion in the negotiations of French and British strategic nuclear forces (which seems unlikely). In the absence of such a willingness on the part of NATO, it is doubtful that Moscow would accept significant reductions in SS-20 and Backfire deployments. In this regard, it is perhaps significant that Foreign Minister Gromyko, while in Bonn on November 23, 1979, did not state that the Soviet Union was prepared to consider reductions in the number of SS-20 launchers and Backfire bombers. The most that Gromyko would declare, under questioning, was that Moscow would entertain proposals to reduce or otherwise limit "launchers for medium-range missiles."¹

It should be recognized as well that NATO's modernization program could encounter major problems of implementation if the perception were to arise among some West European governments that arms control negotiations, once convened, could obviate the need for Pershing II and ground-launched cruise missile deployments.

Despite these problems, the clear sentiment in favor of a solution which includes an arms control component, especially strong within



NATO Europe, suggests that negotiations will be convened, once international political conditions make it feasible. That being the case, Western interests might best be served by attention to these five principles:

- The Special Consultative Group on Long-Range Theater Nuclear Force Negotiations, established in accordance with the December 12 NATO ministerial meeting, provides for the closest possible consultation between the United States and its allies in advance of the negotiations.

The purpose of the Group is to develop a negotiating posture which reflects a genuine Alliance consensus. However, the political sensitivities associated with theater nuclear force issues are such that any negotiating position that does not accurately correspond to the view of NATO Europe might seriously undermine Alliance cohesion and European confidence in American leadership.

- The negotiations should take place in the SALT III framework and not in a separate forum.

To avoid further "decoupling" of American and West European security interests and to minimize the notion of a separable "Euro-strategic" balance, the initiation of theater nuclear force negotiations apart from SALT should be ruled out

by the Alliance from the outset. In the event that SALT III negotiations are deferred, any attempt to convene the discussions as an independent enterprise should probably be rejected.

- NATO should refuse to delay deployments of Pershing II and ground-launched cruise missiles for the sake of negotiations.

To do otherwise would be to eliminate whatever incentives the Soviets might have to limit their theater nuclear forces through the negotiating process. A simple commitment to procure these systems is unlikely to be as effective as their actual deployment in persuading Moscow to consider mutual limitations.

- The principal NATO objective should be to achieve ceilings on SS-20 deployments, as well as forward basing constraints on the Backfire.

It is these two Soviet systems, rather than the nuclear-capable tactical aircraft and the older medium-range bombers and surface-to-surface missiles which pose the most direct and important threat to the security of West Europe.

- NATO should seek Soviet acceptance of a balance of long-range theater nuclear forces as a condition for agreement.

The interests of the Alliance would be ill-served by an agreement to formalize and render permanent Soviet superiority. Another viewpoint, and one which merits serious study, is that limitations on European theater nuclear forces even if asymmetrical in favor of the Soviet Union, might be preferable for NATO to an unregulated arms competition which the Alliance is convinced it cannot win. As part of such an approach, some, including West German Chancellor Helmut Schmidt, have argued that the NATO allies and the Soviet Union might wish to con-

**... It can, however, be enhanced, given a willingness
on both sides to seek an equitable outcome and to forego the
pursuit of military superiority.**

sider a moratorium on deployments in anticipation of, or as a precondition for, substantive negotiations.

In attempting to negotiate a "more stable" balance of nuclear forces in Europe, great caution must be exercised. The problem is complex, in many ways less amenable to negotiation than the limiting of Soviet and American strategic nuclear weapons. The effort to control long-range theater nuclear systems should be made, but it should also be recognized that security in Europe cannot be *ensured* through negotiations. It can, however, be *enhanced*, given a willingness on both sides to seek an equitable outcome and to forego the pursuit of military superiority.

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The prevention of nuclear war

Physicians today must extend their healing imagination to unprecedented threats to human life, threats to the human species. This is not easy. We are much more comfortable in a one-to-one situation of individual doctor and patient.

I myself have strayed a great distance from the medical heartland—not only as a psychiatrist, but as a psychiatrist concerned more with historical than clinical matters. Yet wherever a physician strays, he takes some of that healing responsibility with him.

At this moment in history, physicians can't afford to suppress that responsibility. If we do not contribute our knowledge to the prevention of nuclear war, then where will our offices be, or our clinics or hospitals? Where will we practice our one-to-one healing skills? Dick Gregory was once asked, at an anti-nuclear rally, "What are you doing here? Why aren't you out demonstrating for black rights?" He replied, "Look, if I demonstrate for black rights in the morning and they drop the bomb at noon, there won't be any rights to demonstrate for in the evening." It's the kind of situation we are all in, whatever our professions.

Recent work I've done with former Nazi doctors has, I confess, sensitized me to questions about healing and killing. In their case the perversion was so great as to create a transformation from healer to killer. For most of the rest of us, however, the danger is more that of standing aside, resting on our virtue as healers, even as the world moves closer to destroying itself.

The Hiroshima experience cannot really represent what would happen to people if our contemporary nuclear weapons were used. Today's weapons have hundreds or thousands of times greater destructive power, and the potential is simply not comparable.

Still, even in that tiny Hiroshima bomb experience, there are indications of the psychology of the nuclear age, of what I sometimes call Nuclear Man. These indications have a lot to do with questions of boundaries and the new boundarylessness of human destruction. That is why I called my book about Hiroshima *Death in Life*. The death that survivors carried on in their continuing lives was not the ordinary structured death of individuals; it was grotesque, absurd, collective, unacceptable, unabsorbable death.

That's what the politicians don't talk about. It isn't so much what Khrushchev said—that the survivors will envy the dead. It is rather that the survivors themselves will be as if dead.

In a split second of being exposed to that first atomic bomb dropped on a human population, everybody in Hiroshima experienced a permanent encounter with death. We can think of that encounter as taking place in four stages and becoming endless.

- The first stage is obviously the moment of the bomb's fall, the overwhelming emergence of death, of the dying and near dead around one. Even the estimates of the number killed are indicative, because nobody really knows how many people were killed in Hiroshima: anywhere from around

60,000 to 300,000. The city of Hiroshima estimates 200,000. It depends upon how you count, which groups you count, whether you count deaths over time. And it depends on emotional influences on the counters. It is of some significance that American estimates have tended to be lower than Japanese.

The real point is that even that small event doesn't lend itself to calculations of the degree of destruction. Certainly, all of Hiroshima immediately became involved in that atomic holocaust. No one relatively near the center of the city would escape from the sense of ubiquitous death. So I characterize as the most significant psychological feature of this first stage the sudden and absolute shift from normal existence to an overwhelming encounter with death.

The main function of what I call psychic numbing is diminished capacity or inclination to feel, to take into account the experience of what happens at the receiving end of the weapon. When people described this to me, some said, "My first feeling was: I think I will die, this is the end for me." But it was more than the idea of individual death.

In Hiroshima those early images included something like the idea that the whole world was dying. As one professor put it: "My body seemed all black, everything seemed dark, dark all over; then I thought, the world is ending." A Protestant minister, responding to the scenes of mutilation and destruction as he walked through the city, said: "The feeling I had was that everyone was dead. The whole city was destroyed.



I thought that all my family must be dead. It doesn't matter if I die. I thought this was the end of Hiroshima, of Japan, of humankind." And a woman writer: "I thought it must have been something which had nothing to do with the war; the collapse of the earth which is said to take place at the end of the world which I had read about as a child."

The related feeling that survivors conveyed to me was confusion over who was alive and who was dead. Many said, "I did not think I was really alive," or they spoke of human ghosts, people who walked in the realm of dreams. The breakdown of the dividing line between life and death was manifest.

- The second stage of this permanent encounter with death was what I came to call invisible contamination—the acute impact of irradiation. Unprecedented and totally unknown, it was grotesque and mystifying to the people of Hiroshima to see in themselves and others, whether within minutes or hours, or over days, weeks, or months, the symptoms of acute irradiation. These can be gastrointestinal, with anorexia, severe bloody diarrhea, weakness, high fever. There can also be bleeding into the skin and from all orifices. Later manifestations were disfiguring symptoms, including the loss of all body hair. And of course, very low white counts were observed when blood tests could eventually be made in a few people.

This gave the people in Hiroshima the image of a weapon that not only kills and destroys on a colossal scale, but also leaves behind, in the

bodies of those exposed to it, deadly influences which may at any time strike down their victims. And that second stage is epitomized in a series of rumors that swept Hiroshima soon after the bomb fell.

One was perhaps predictable: that everyone who had been exposed to the bomb would be dead within a certain time, say two or three years; or that the city would be uninhabitable for as long as 75 years. But there was a second rumor, even more frequently reported to me, and perhaps with even greater emotion: the belief that trees, grass and flowers would never again grow in Hiroshima. Here the underlying meaning was that life was being extinguished at its source, an ultimate form of desolation that seemed to encompass but go beyond human death.

- The third encounter with death had to do with delayed radiation effects, not months but years after the atomic bomb itself. In the late 1940s and early 1950s, people began to talk about what they called A-bomb disease. That condition has no scientific standing, but it was terrifying psychologically. The model for what people called A-bomb disease was leukemia, because it was discovered within three years or so that the rate of leukemias had increased among those significantly exposed to irradiation in Hiroshima. Many leukemia symptoms are very similar to those in acute irradiation, so people had the sense of the bomb's effects continuing indefinitely, and of always being lethal.

Then, sometimes decades later, there began to emerge increased in-

cidence of various forms of cancer. Thyroid cancer showed earlier increases, but afterwards there was more cancer of the breast, lung, ovary, and other areas. These cancers are not very rare; but now, even if the incidence is only slightly increased, it again creates the sense of endless lethal influence, the feeling the bomb can do anything and anything it does is likely to be fatal.

There also is a vast medical or psychosomatic gray area. Many of the medical issues relating to Hiroshima are still uncertain, and we do not have a complete grasp of them. But in the areas of blood disease, endocrine and skin disorders, damage to the central nervous system, premature aging, impairments in early development and a vague borderline condition of general weakness and debilitation, there are positive findings by some observers. True, there is often a lack of systematic confirmation in controlled populations; nobody is quite sure. But there is a psychological bind for the survivors because any kind of condition, from fulminating leukemia to a common cold, creates the immediate association with A-bomb disease, with bomb fatality.

Another issue is that of genetic effects, again a controversial one in Hiroshima. The lay population of Hiroshima confuses genetic effects with conditions that have nothing scientifically to do with them, specifically, the damage to fetuses or embryos in utero. This damage, of course, results from the destructive effects of irradiation on sensitive, rapidly growing tissue. There were, of course, striking microcephalic and



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other forms of mental retardation directly attributed to radiation effects from the bomb, and these were immediately associated with genetic effects.

There is still much concern about second generation survivors in terms of potential genetic effects. Another theory is that the second generation may not be affected but the third generation may be. Can anybody know? We do know that genetic effects can occur, and that nobody can guarantee that survivors of Hiroshima or their descendants won't be affected. This, too, gives people a sense of an endless chain of lethal possibilities: if ill effects don't appear in one year or in one generation, they may well appear in the next.

• The fourth—or really the continuing—endless stage is that of, simply, the identity of atomic bomb survivors. I began to call it an identity of the dead or of the people who feel dead. Many survivors did recover to a considerable degree. Many worked and married, although they also met discrimination about jobs and marriage under the "rational assumption" that, being weakened through irradiation exposure, they would make less reliable workers, or would be defective husbands or wives genetically. But beneath those reasons was the sense that these survivors carried a special death taint that was threatening. People wanted to move away from them, to stay away from them.

It is as if the victim had internalized or absorbed the horror and evil of that which had victimized him—a very cruel psychological fate. There has not been a capacity among the people of Hiroshima to deal adequately with the experience, with their losses; in short, to commemorate the experience in a satisfying way.

They have tried many things.

There have been survivor missions of great importance in which people have taken the responsibility of telling the world about nuclear war in order to give some meaning to what they have been through. These attempts have sometimes ended in conflict and political controversy.

There is no model. There is no proper way to behave for an individual or city that has felt the effects of an atomic bomb. This has to do with the destruction of the social fabric; even though the city of Hiroshima has been rebuilt, the social fabric of that community of survivors has not. A single small weapon has created a totality of destruction. There is unending lethal influence, a sense of being a victim of a force that threatens the species, that reverberates psychologically on those same people. That is quite a lot for this tiny first weapon of the nuclear age.

The point is sometimes raised that the people of Hiroshima were worse off because they had no prior knowledge of the bomb's effects. If it happens now, people will know it is irradiation. Will that help? It is still invisible contamination, and knowing its deadly nature may be just as painful as the terrible mystery that afflicted Hiroshima. Should the bomb actually fall, being informed does not seem a great advantage.

What was crucial was the existence of an outside world to help. People could come from outside of Hiroshima. Some doctors came from nearby cities. And when the occupation forces appeared they were helpful too. The help was sporadic and inadequate at the beginning; people died from lack of medical care over the first years. But still, the outside world was there. With today's nuclear weapons, can there be any assurance of this source of help? I don't think so.

Edward Teller writes in his extra-

ordinarily misleading book, *The Legacy of Hiroshima*, that "rational behavior" consists of having the "courage" to use nuclear weapons when tactically indicated, and to be "prepared to survive an all-out nuclear attack." My response is that this rational behavior is the logic of madness, and deadly madness at that.

Similarly, Herman Kahn, in his earlier study on thermonuclear war, tells us that a reasonable, or non-hypochondriacal individual who survives a future nuclear war "should be willing to accept almost with equanimity, somewhat larger risks than those to which we subject our industrial workers in peace time." He also talks about preventing undue fear of irradiation right after the nuclear attack by having available individual meters, a variety of geiger counters, to measure everybody's irradiation levels. He gives the example of a man who is ill from something, presumably other than irradiation: "You look at his meter and say, you've only received ten rems, why are you vomiting? Pull yourself together and get to work."

Here I must tell Herman Kahn that nuclear weapons make hypochondriacs of us all, if we survive. His wishful scenario of recovery has little to do with the way people behave, and his psychological assumptions are as faulty as his moral ones.

Some things are happening that raise real hope for a change in consciousness about nuclear weapons.

In the mid 1940s there came into the world a new image, that of exterminating ourselves as a species with our own technology. This image had been put forward by earlier visionaries like H. G. Wells. And indeed Leo Szilard realized that a nuclear weapons was possible after reading Wells' fiction. Of course,

'In a dark time, the eye begins to see.'

Szilard knew a few things in addition to what Wells had written. In the mid-1930s, he wrote to the 10 or 15 physicists in the world who were working in atomic physics and asked for a moratorium on publication of papers that might be potentially useful in the making of a nuclear—or atomic—weapon. They all agreed to the moratorium, except Pierre Joliot-Curie, in France, who never responded. Szilard later asked him why, and he replied that his research institute in Paris needed funds, and had to get out a few more papers in order to get more research support. That is not unfamiliar in our time.

Although the idea of apocalypse has been with us throughout the ages, it has been within a religious context—the idea that God will punish and even eliminate man for his sins. Now it is our own technology and we are doing it ourselves. Nor is it only the nuclear threat. There are chemical warfare and germ warfare; destruction of the environment, the air we breathe or the ozone layer; the depletion of the world's resources, whether of energy or food.

All of these have given us an image of potential extinction and tend to

merge psychically in our minds. What we need is a psychology that moves away from instinct and defense toward symbolization of life and symbolization of death.

We all as human beings have not just immediate psychological responses, but also what Paul Tillich called ultimate concerns—or what I call the symbolization of immortality. This is not denial of death; it is part of the fact that we know that we die. We also know that we live as cultural animals in some sort of continuum with those who have gone before and those who will go after our finite life span. So we seek a sense of living on in our sons and daughters and their sons and daughters. That is the biological mode of symbolizing immortality.

There is also a creative mode of influence, of living on in what we convey to our students, our readers or just to our friends. This is the human influence that we leave behind us.

A third mode is a religious one—the concept of a spirituality in which death is in some degree conquered—which may or may not postulate something like life after death.

A further mode is that of living on in eternal, unending relationship to nature. And finally, there is the traditional mode of the mystics, the psychic experience so intense that time and death disappear.

These are all part of our normative and necessary functioning. They are left too much to the philosophers and theologians, but are very much a matter for psychology. If we consider the possibility of nuclear extermination or near-extermination, who can then believe in living on in our sons and daughters and their sons and daughters in the biological mode; or in living on through our works? What works will continue, what influences?

Even in a theological sense, it would seem that, as the people in Hiroshima repeatedly told me, there was no idea powerful enough to help them accept what had happened to them. It may be that religious ideas, to be effective, require a sense of being among the living. And because we are capable of destroying the environment with our technology, even nature is not assuredly there for us.

Many of the young and not so young, who made the effort to move into a communal life in nature, were not seeking only a solution for a post-industrial society. Rather, they were trying to recapture a human relationship to nature which they felt was being threatened.

All of these modes are not lost to us totally; they are in doubt. And it is perhaps that doubt about human continuity that has given such great emphasis in recent decades to the last mode I described: the experience of transcendence. Perhaps that has a lot to do with the seeking of highs through drugs or through meditation or, for that matter, the appearance of the extremist religious cults which offer many kinds of highs and give a kind of cosmology



"Well! That concludes my statements about the kill capacity of the XL missile. Who would like some coffee and donuts?"

Richard Cline, United States

We have to remember that it is wrong, it is evil to engage in genocide or to project genocidal scenarios . . .

that in many cases takes into account the nuclear threat.

There is some recent work that suggests a way of getting at some of these psychological reactions as they affect specific people. Michael Carey, a former assistant of mine, did a study in the mid-1970s of people of his generation, then in their late twenties and early thirties.

He started by interviewing them about those quaint air-raid drills of the 1950s, in which students were taught that there was a terribly dangerous weapon but that you could protect yourself from it if you put your head under the desk or put a piece of paper over your head. Perhaps this was part of what Edward Teller called preparation for all-out nuclear attack.

Carey then questioned them about general ideas such as death and dying, human continuity, and other concepts stemming from these. Very simply, his findings, confirmed by others studying related matters, were:

- first, there was an early experience of absolute terror, of dreams, fears, fantasies of total destruction involving family, parents, oneself.
- that was suppressed fairly soon, often in later childhood: a kind of period of suppression or latency.
- later on, often in late adolescence or in adult life, there would be some form of return of what had been, or the emergence from psychic numbing, with all kinds of dreams and fears.

Sometimes people divide themselves into those who think a great deal about these things and those who don't. But almost every person interviewed produced, after just one or two questions, a flow of associations. Nor did it make a difference whether the interviewee defined himself or herself as the kind of per-

son who was concerned about these matters.

Certain themes emerged, one of them being the equation of death with collective annihilation. In early childhood, we all began to learn the terrible lesson that death is forever: when you die you don't lie down and then get up, as children like to play in games. But, for many in our culture, learning about death is simultaneous with the association of annihilation. That, I think, is an enormous deformation which we have hardly begun to think about. It may be the fundamental deformation of the nuclear age.

A second theme in Carey's work and other studies is that of pervasive doubts about the lasting nature of anything. It might be labeled the new ephemeralism: nothing can be trusted to last. I think this is related to attitudes toward work, ranging from extreme hedonism, the so-called hippy ethos, to a committed focus on a narrow definition of work.

A third theme is the perception of craziness. Of course, those six-year-old kids were much too intelligent to believe that putting a piece of paper over their heads would protect them from the bomb. This perception had much to do with a sense of absurdity in that generation, and it can be a healthy sense. The whole idea of combatting the

bomb seemed crazy; the authorities seemed crazy; the world seemed crazy, as indeed in many ways it is.

There was even the theme of identification with the bomb. Some of the people in Carey's study wanted to see it go off, because they were curious about it, or because it gave them a sense of power to imagine the bomb going off. That is a dangerous one, unfortunately present in certain highly placed people in our society.

A final theme is that of a double life, which we all lead in this nuclear age. When we think about it, we know that in a moment, through miscalculations, error, the wrong kind of nationalism or ideological excess, a nuclear war may start; most of humankind may be exterminated. Yet we also go on living our ordinary lives, doing our work, going about our ordinary everyday matters as if there were no such threat.

In a social and perhaps a political sense, we are in a revolutionary situation without an appropriate response. It became evident in Carey's study that the double life is immobilizing. The capacity to do something, to release the energy needed to act on these issues, would be enormously beneficial—potentially to the world, but also to people caught up in this immobility.

The Effects of Nuclear War

Produced as background for SALT by the Office of Technology Assessment, this report analyzes several levels of nuclear exchange, and estimates the immediate loss of human life and the "collateral" damage—to hospitals, the water and food supply, and so forth—that would affect the chances of survivors ("... A bomb falling in the vicinity of the University of Detroit ... 1,000,000 estimated immediate casualties; one-half million in need of medical attention ... half the hospitals in the city have been obliterated ..."). The report has been called "astounding" and "a blockbuster." It is, in the event, the first of its kind that is not a defense analysis, and, in the present state of the predictive art, probably truthful. It speaks not only to the specific issues debated in SALT, but to the risks inherent in calculating a limited nuclear exchange, and to the contradictions that increasingly appear to vitiate the politics of deterrence. It is available in a hardbound edition for \$9.95 from your bookstore, or from the publisher.

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... When we have achieved that simple kind of moral perspective, we can begin to take in some of the realities of what does happen at the other end of these weapons.

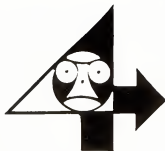
Two other deformations deserve attention. One is the psychic numbing to which I have already referred. It has to do with diminished capacity or inclination to feel. It can take the form of a blocking of feelings or images, or both. People in Hiroshima could say to me: "You know, I could see what was going on around me, I could see people dead or dying, but suddenly I felt nothing." But this psychological blocking occurs in all of us, and certainly in those who make the weapons or project their possible use.

Worse than that is what I term the religion of nuclearism, in which we embrace the very agents of our potential extermination as a source of salvation. Herman Kahn and Edward Teller exemplify an ideology in which the weapons themselves become a solution to death anxiety, to restoring a lost sense of immortality.

Robert Oppenheimer thought that the dropping of the bomb would teach mankind a lesson, so that maybe there would never be wars again. We also tried to use the bomb diplomatically, to attain goals we could not otherwise achieve, to replace human efforts, psychological and human skills. Some of the reluctance to face the enormous dangers inherent in nuclear power stems from this deification of the nuclear weapon. The deity, if it can destroy, can also create a world of milk and honey.

There can also be a kind of nuclear backsliding. Oppenheimer, who was very committed to using the first bomb, finally came to a sense of revulsion—not with the beginning of the hydrogen bomb but with the large thermonuclear bomb. He then wrote brilliantly on its dangers, not just to us as a species but also to our minds. But when he underwent this reversal he was crucified.

There are devil's bargains in all cultures. An American example was



closing our eyes to holocaust. That has changed, but we tend more to talk about holocausts of the past. We don't talk much about the danger of future holocausts. And when we do there is an enormous effort to domesticate holocaust and the experience of survivors. We are familiar with the bland language of nuclear weapons: exchanges, stockpiles, scenarios.

Sometimes, however, events break through the devil's bargain. One was the Three Mile Island accident and the other, seemingly unrelated, the showing of the film, "Holocaust." Both evoked extraordinary responses, and my point is that the two events didn't create these anxieties and responses. They tapped pre-existing anxiety and a sense of terror around this imagery of extermination.

In such anxiety we can find at least the seeds of a more formed awareness. We need a certain amount of anxiety or tension to overcome the numbing. The kind of psychic numbing that makes us comfortable and that we have always resorted to, functions to keep us from thinking about these things. But that very kind of numbing is enormously dangerous collectively to the survival of the species.

There is a real conflict. The ideal level of tension is hard to achieve, but we must constantly seek it. To

act effectively, it isn't necessary first to realize all the terrible things that the nuclear weapons can do. Of course, we must eventually come to that realization. But the other way around also works: We need some kind of humane standard. We have to remember that it is wrong, it is evil to engage in genocide or to project genocidal "scenarios." And then, when we have achieved that simple kind of moral perspective, we can begin to take in some of the realities of what does happen at the other end of these weapons. We are numb to reality without that simple act of moral imagination.

A potential change of consciousness is held out before us. The responses to Three Mile Island in particular are strongly resisted; there is a psychological and economic tendency in which the more evidence there is of the extraordinary danger of nuclear power, the more effort there is to deny that evidence.

But in my view the increasing awareness of the danger of nuclear power has enormous bearing on the nuclear weapons issue—not only because of the technological relationships, but because nuclear energy gives us a more direct perception of threat. The "wisdom of the body" senses that this stuff can annihilate us. And that in turn can affect our concerns about nuclear weapons.

Perhaps it is too soon to speak of a shift in consciousness having occurred. Perhaps it is a turn toward awareness, just as we used to speak of a turn toward peace in connection with the Vietnam war. But that is a great deal. Certainly, we have to agree that however things go, we are all involved in the process.

There is a wonderful line from Theodore Roethke, the American poet, which has haunted me since I read it some time ago: "In a dark time, the eye begins to see." □

Five years ago scientists recommended a thyroid protection strategy in the event of a nuclear reactor accident. Why is it that the Nuclear Regulatory Commission has not yet adopted these emergency safety measures?

FRANK VON HIPPEL

The NRC and thyroid protection —one excuse after another

On March 1, 1954, the United States fired off a large nuclear weapon over Bikini in the South Pacific. Five hours later coral blown miles high by the blast filtered down like snow over the inhabited atoll of Rongelap, some 100 miles downwind. This fallout was radioactive. The population was evacuated before anyone received a lethal dose of radiation, but years later the children began one after another to develop thyroid tumors. By the time these children reached the age of 21 almost all had undergone thyroid surgery and had been placed on thyroid medication for the rest of their lives.¹

The cause of the damage to the children's thyroids was the radioactive iodine in the fallout, which had contaminated their drinking water. Because the thyroid gland, whose function is necessary to normal growth and metabolism, concentrates any iodine in the body, the children's small and rapidly developing thyroids had received a greatly magnified dose of radiation.

Since the story of the Rongelap children was written up in the medical literature, there have been periodic proposals to have a thyroid protection strategy available in case there should be a large release of contaminated steam containing radioiodine during a nuclear reactor accident.² Particular attention has been focused on thyroid protection because, measured in terms of the numbers of people who could be affected, thyroid damage is potentially the largest single hazard from an accident.

The number of damaged thyroids that would have resulted from a melt-

down accident with failure of containment at Three Mile Island could have ranged, depending upon the wind direction, from thousands to hundreds of thousands of cases.³

Fortunately medicines exist that could protect the thyroid from radioiodine. In 1979 one of these, potassium iodide, an inexpensive chemical found in small amounts in "iodized" table salts, was certified "safe and effective" for use in a radiation emergency by the Food and Drug Administration.⁴ If taken in the recommended dosage just before exposure, the nonradioactive iodine in the potassium iodide will saturate the thyroid and block the uptake of radioiodine inhaled or swallowed during the next 24 hours.

In order to be able to protect thyroids in an emergency, however, it would be necessary to have large quantities of potassium iodide available in the proper dosages. For this reason a study group of which I was a member made a recommendation to the Nuclear Regulatory Commission in 1975 that "a national policy of stockpiling thyroid-blocking chemicals for possible emergency distribution should be established."⁵

The Commission did not follow up on our recommendation—perhaps because its regulations required that nuclear power plants be designed so that the risks from major releases of radioactivity would be "negligible."⁶

In March 1979, however, the events at Three Mile Island made the probability of a major release seem not so negligible after all; at some moments a large release appeared likely. Therefore, three days after the accident began, in a frantic effort ini-

tiated at 3:00 a.m., the Food and Drug Administration asked first one drug company and then others to begin production of potassium iodide solution. Air Force and commercial jets and Army trucks brought 250,000 one-ounce bottles of the thyroid-blocking chemical, and 250,000 eye droppers together for assembly and then shipment to Harrisburg.⁷ The government moved with impressive speed once it had made its decision. But if there had been a major radioactive release at Three Mile Island, the drug probably would have arrived too late.

One might have expected that after this experience the government would immediately have taken steps to make sure that it would not be caught again without either the thyroid-blocking chemicals or a distribution system. However, the Nuclear Regulatory Commission's staff has given one reason after another for not acting.

The first reason was concern about the possible side effects of potassium iodide. When asked, however, to explain why the staff disagreed with the FDA's conclusions that "the risks from the short-term use of relatively low doses of potassium iodide in a radiation emergency are outweighed by the risks involved from exposure to radioiodine," Harold Denton (Director of the NRC's Office of Nuclear Reactor Regulation) responded in July 1979 that they had none. But Denton had another reason for opposing thyroid protection: "For higher doses of radiation to the thyroid (greater than 1 rem), it may be better to evacuate the population."⁸

If the staff's previous concern about possible side effects from potassium

iodide was surprising, the implications of this new proposal were mind boggling. Thyroid doses of tens to hundreds of rem are possible more than 100 miles downwind from a reactor accident. Washington (at 90 miles) and New York (at 160 miles) would have been well within the range of thyroid-damaging doses of radioiodine had there been a major release at Three Mile Island. And there are many other nuclear power plants much closer to both cities. Did Denton really prefer the possibility of facing a decision to evacuate Washington or New York within a matter of hours to the alternative of having thyroid protection available?

Such questions apparently had some impact because there were no more assertions from the Nuclear Regulatory Commission that evacuation was an adequate alternative to thyroid protection medicine. Early in 1980, however, a new argument against potassium iodide was discovered. The NRC staff had done a cost-benefit analysis that concluded that stockpiling "potassium iodide appears only marginally cost-effective at best."¹⁰ The "proof" assumes, among other things, that given a population of approximately 100 power reactors such as the United States has today, a large release of radioactive iodine from a reactor accident will occur only once in a thousand years.

Stockpiling potassium iodide against such an unlikely event would obviously be a waste of money. But can we be confident that a serious reactor accident is that improbable? Where did the staff get the one-in-a-thousand reactor years release probability anyway?

The probability estimate came from the NRC's 1975 Reactor Safety Study (also known as WASH-1400 or the Rasmussen report). The calculations made in this report became so controversial, however, that in 1977 the NRC was forced to set up a special outside committee to review them. As a result of this review,¹¹ in early 1979 the Commission announced that:

"In the light of the Review Group conclusions on accident probabilities, the Commission does not regard as reliable The Reactor Safety Study's numerical estimate of the overall risk of reactor accident."¹²

The staff's cost-benefit calculation was therefore based on an estimate of the likelihood of an accident that the Commission had more than a year earlier officially dropped as unreliable.

It is now five years since our group recommended a thyroid protection strategy, and the NRC staff is apparently still unwilling even to think seriously about the subject. Why? Perhaps the answer lies in the history of the Commission.

Until 1975 the Nuclear Regulatory Commission was part of the old Atomic Energy Commission (AEC), an agency whose primary civilian mission was to promote nuclear power. Because of its promotional orientation, the AEC tended to play down the serious hazards associated with nuclear power. This tendency is what ultimately caused Congress to break up the AEC in 1974 and split off the Nuclear Regulatory Commission as a separate regulatory agency. Most of the NRC's senior staff dates

back to the AEC, however, and these old-timers brought along with them some of the original reluctance to face "sensitive" regulatory issues.¹³

The question of stockpiling potassium iodide is a sensitive issue because if the Commission visibly prepares for the possibility of a large release of radioactivity, the public may become convinced that such an accident is not only possible but probable.

It is no longer part of the NRC's job description, however, to make the political environment safe for nuclear energy. And even if it were, the agency should have learned from the history of the Atomic Energy Commission, whose overprotectiveness ultimately backfired and became the nuclear industry's biggest liability. Now it seems that the NRC has come to the same crossroads. Unless the public soon sees the Commission making some of the hard decisions on reactor safety that the Atomic Energy Commission refused to make, it is likely to become a majority view that the only safe nuclear power plant is the one that has not been completed. It might seem an irrational conclusion in view of the fact that the public has quietly accepted much greater hazards such as nuclear weapons in its midst—but it would be an understandable one. □

1. Robert A. Conard and others, *A Twenty-Year Review of Medical Findings in a Marshallese Population Accidentally Exposed to Radioactive Fallout*, BNL 50424 (Upton, N.Y.: Brookhaven National Laboratory, 1975).

2. R. O. Chester and C. V. Chester, "Emergency Planning for Accidental Radioactivity Releases from a Licensed Nuclear Facility," in *Health Physics Division Annual Progress Report for Period Ending July 31, 1973*, ORNL-4903 (Oak Ridge, Tenn.: Oak Ridge National Laboratory, 1973), p. 172; "Report to the American Physical Society by the Study Group on Light Water Reactor Safety," *Reviews of Modern Physics*, 47 (Summer 1975), p. 109; National Council on Radiation Protection and Measurements, *Protection of the Thyroid Gland in the Event of Releases of Radioiodine* (NCRP, 1977), p. 55.

3. The calculated number of cancer deaths



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under the same assumptions ranged from hundreds to tens of thousands. Jan Beyea, "Some Long-Term Consequences of Hypothetical Major Releases of Radioactivity to the Atmosphere from Three Mile Island." Draft Report to the President's Council on Environmental Quality (Princeton University, Center for Energy and Environmental Studies, Sept. 7, 1979).

See also U.S. Nuclear Regulatory Commission, *Reactor Safety Study* (WASH-1400, 1975), pp. 117-25.

4. *Federal Register* (Dec. 15, 1978), p. 58798.
5. "Report to the American Physical Society."

6. Since in early 1975 the Nuclear Regulatory Commission had just been severed from the old Atomic Energy Commission, I must refer to an AEC document for a contemporary articulation of this position. The following passage is taken from the AEC publication, *The Safety of Nuclear Power Reactors and Related Facilities* (WASH-1250, 1973), p. 5-19:

"Defense in depth through multiple physical barriers, quality assurance for design, manufacture and operation, continued surveillance and testing and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents more severe than the design basis accidents will remain of such low probability that environmental risk is negligible."

The NRC has estimated that in a design basis accident only one in 10 million radioactive iodine atoms in the reactor core would be released from the containment building of a pressurized water reactor and even less from the containment of a boiling water reactor. In contrast, for an accident involving a reactor core meltdown and a failure of the containment building (as a result of over-pressure or a steam explosion), it was estimated that 10 to 90 percent of the radioactive iodine in the core would be released to the atmosphere. See U.S. Reactor Safety Study, Table V1-2-1.

7. Robert Reinhold, "Frantic Team Effort Provided Vital Chemical for Endangered Area," *New York Times*, April 4, 1979, p. A-16.

8. Memorandum for Commissioners Richard T. Kennedy and John Ahearne from Harold R. Denton, Director, Office of Nuclear Reactor Regulation, "Use of Thyroid Blocking Agents in an Emergency Response Program" (July 13, 1979). Enclosure, "Response to Commissioner Ahearne's Questions Concerning Thyroid Blocking Agents," p. 3.

9. Frank von Hippel, letter to NRC Commissioner John Ahearne, August 14, 1979.

For two calculations of average thyroid doses versus downwind distance that are in close agreement with each other, given the same assumptions about the magnitude of the release, see D. C. Aldrich, P. McGrath, and N. C. Rasmussen, *Examination of Offsite Radiological Emergency Protective Measures for Nuclear Reactor Accidents Involving Core Melts* (Nuclear Regulatory Commission,

NUREC/CR-1130, 1978); or Jan Beyea, "Some Long-Term Consequences."

The NRC report shows adult thyroid doses of 130 and 30 rems respectively at distances 90 and 160 miles downwind from a large release of radioactive iodines from a reactor accident. Thyroid doses to children would be 2 to 5 times higher. The NRC value (n.3) for the child/adult dose ratio is two (which is approximated then as one). The EPA value is five. (U.S. EPA "Environmental Analysis of the Uranium Fuel Cycle, Part II: Nuclear Power Reactors," EPA-520/9-74-003-C, p. 113-18.)

10. David C. Aldrich and Roger M. Blond, *Examination of the Use of Potassium Iodide (KI) As an Emergency Protective Measure for Nuclear Reactor Accidents* (U.S. NRC Draft NUREC/CR-1433, March 1980), p. 31.

Two other assumptions made in this widely distributed draft report are as follows:

- In discussing the benefit side of its "cost-benefit" analysis the report mentions but does not take into account in its calculations the fact that the thyroid blocking medicines would protect the thyroids of a large fraction of the U.S. population from reactor accidents at more than one reactor. Within 200 miles of New York City, for example, there are 13 operating power reactors. Within about 100 miles from Washington, D.C. there are 10 operating reactors. The quantitative cost-benefit analysis assumes implicitly, however, that each person in the United States is within 200 miles from, at most, one reactor.

- On the cost side of the analysis, the report assumes that any thyroid protection strategy would necessarily require the stockpiling of 200 million bottles, each containing a 14 days' supply of potassium iodide for an adult.

11. *Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission*, NUREC/CR-0400 (NRC, 1978).

12. Nuclear Regulatory Commission, "NRC Statement on Risk Assessment and the Reactor Safety Study Report (WASH-1400) in Light of the Risk Assessment Review Group Report," January 18, 1979.

13. The President's Commission on the Accident at Three Mile Island (generally known as the Kemeny Commission) expressed its concern about this attitude in its report:

"While some compromises between the needs of safety and the needs of an industry are inevitable, the evidence suggests that the NRC has sometimes erred on the side of the industry's convenience rather than carrying out its primary mission of assuring safety."

The Need for Change: The Legacy of TMI (1979), p. 19.

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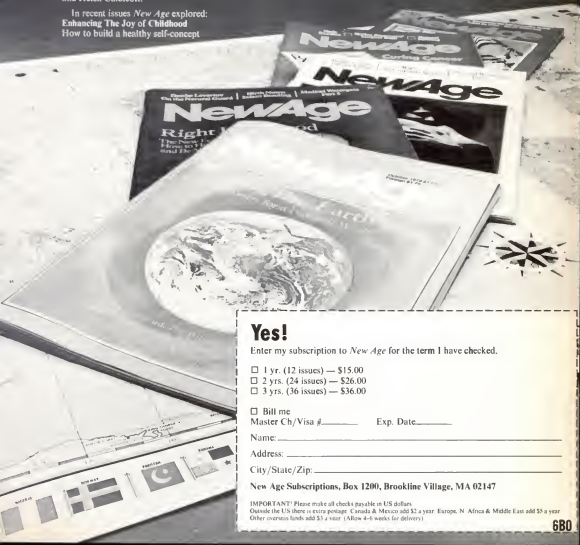
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ROBERT A. SOLO reviews

Technology and East-West Trade

Office of Technology Assessment,
Congress of the United States, GPO,
Washington, D.C., Library of Congress
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600203, 303 pages,

Two and a half cheers for Ronnie Goldberg and the others associated with the Office of Technology Assessment project on *Technology and East-West Trade* for a useful and well done report. Its 11 overlapping "chapters" are in effect self-sufficient essays of varying quality. Starting with a "summary: issues and options," it continues with a review of current policy proposals, those "aimed at efficiency," and those "designed to restrict" and those "designed to encourage East-West trade and technology transfer." It goes on to consider the economic, the foreign policy, and the military "implications," presented as a series of arguments pro and con, of East-West trade, with technology taken as the critical component of such trade; "Military implications" emphasize the assessment of risks. "Definition and measurement" deals briefly with the classification of "high technology."

The subsequent chapters reconstruct the historically developed situation wherein East-West trade came to constitute a particular problem with a consequent and responsive evolution of policies and their instruments of implementation, where controversy unfolds and allied nations develop diverse and opposing positions. The report concludes with chapters on western technology in the Soviet Union and the People's Republic of China. The former is particularly shallow and pretentiously all encompassing.

The character of the report is marked, and its more general value is limited by its special function and indeed by the function of the Office of Technology Assessment, which is to service and serve at the convenience of Congressional committees. With that as its task and with Congress as its client, it can oppose no established position. It must accommodate to the values, outlooks, and prejudices (which in this field of policy choice are fanatic and deep) of the Congressional leadership.

For these reasons, presumably, one should not expect to find here any unifying theme, any testing and refutation of popular hypotheses, any ordering of preferences, any denunciation of wrongheadedness, any exposure of the contradictory and irrational, any suggestion of policy failure or error, any scaling of the considerations that might enter into choice, any sense of conviction or strong argumentation leading to positive conclusions for policy and choice.

The prototype of the report is the Congressional hearing where one partisan group formulates and states its position, assembling available and conventional statistics, making an argument that is heavy on anecdote and light on analysis in support of its position, its interests and its demands, to be followed by another partisan group, and another and another in sequence, while, jury-like, the Committee members listen, consider and take their pick. Not that all possible positions, options, concerns are given equal weight, or given any weight at all.

In *Technology and East-West Trade*, as in a Congressional hearing, the weight and consideration given to a particular argument is directly a function of the organization of the group that makes it. In dealing with "the economic implications of East-West trade and technology

transfer," for example, after presenting an assemblage of general statistics, the report presents at length first the side of corporations who sell or would like to sell technology to Eastern European countries and China, then the argument of the American companies who compete or who fear the competition of imports; then the argument of actual or possible "importers of East European technology." A single paragraph gives a cursory and ritual nod to the interests of the consumer. No attempt is made to speculate on the net effects on technological advance, economic growth and development, in exploiting comparative advantage and the benefits of trade and technological exchange for the economy at large.

East-West trade has so far been of relatively minor importance, and the value of Soviet imports of "high technology" items has been a small proportion (in 1977, 17.6 percent) of their import total. And, compared to the rest of the West, American trade with Eastern Europe has been particularly small and insignificant. Thus in 1977, American imports of less than \$1 billion and exports of \$2.5 billion for Eastern Europe and the Soviet Union (.9 percent and 2.2 percent of total U.S. imports and exports) compare to exports of \$29 billion and imports of \$25 billion for Western Europe and Japan.

The great and ineluctable constraint on the expansion of East-West trade is in the difficulty of organizing a system of exchange between politically-directed and market-directed economies. Those economies where output is centrally planned and consumption is controlled by the state, must ultimately finance their imports from the West through the hard currency sales of their goods to the West where purchases are by individuals and by corporations in the private sector.



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"All around trading companies" in Japan, corporate barter deals with the Soviet Union, joint ventures in Eastern Europe constitute at least a marginal accommodation to this difficulty. The report never comes to grips with this problem. Nothing is suggested that would open the way for a significant and rational expansion of imports from Eastern Europe and China as, for example, might be organized through public sector to public sector exchanges, with Western governments using exchange surpluses to procure imports on public account for consumption not in the private but in the public sector.

American policy with respect to trade with the East, and particularly toward trade with our favorite enemy, wavers between incommensurable positions. On the one side are the hard liners, with their power now immeasurably strengthened by the Afghanistan confrontation and the consequent waves of xenophobia and patriotic passion that have been such a boon to the discredited Mr. Carter. For them the situation is crystal clear. Whatever the enemy imports must be to his advantage or he wouldn't import it: his advantage is our disadvantage. Even that which increases his productivity in the most innocent of pursuits, releases manpower for pernicious purposes, and ends by raising his military potential. Hence to allow any trade with the "other side" constitutes an unwarranted concession.

Against this are those who would encourage at least a moderate increase in trade with the East, for the sake of detente, to satisfy corporate clients who see profits to be made that way, or even who sense that trade might yield benefits all around. A policy that wavers between these two positions as a barometer of public sentiment permits no clear sense

of purpose and enables no logical deduction of criteria of choice.

Our West European allies and Japan do not share our perspective. They all are and have been anxious to promote trade with the non-market economies of Eastern Europe and with China, and have encouraged and supported such trade, except in weapons and directly related items. As their technology becomes equivalent to or surpasses ours, and as their nationals, and subsidiaries of our own multinationals abroad under their aegis, seek to trade with the East, the U.S. licensing constraints and sanctions become a charade.

Most depressing was the political attitude and outlook reflected in the report—as out of line with reality as that of the Colonel Blimps who, not so long ago, spun out their calculations and fantasies in Whitehall on the assumption of undiminished British power and glory. It is one that denigrates every aspect of the Soviet economy, blind to its formidable achievements, and that conceives the United States' economy as the norm and measure of efficiency, as the central if not the sole source of innovation, as the temple of high technology, as possessor of the secrets, as teacher never learner, with everything to give and lose and nothing to get and gain. This view ignores or is ignorant of our spectacular decline in technological pre-eminence, our crumbling bastions of economic strength even in steel and automobiles, the seemingly incurable weakness of the dollar with deficits unceasing, the absolute and continuing decline in industrial productivity. □

Robert Solo is professor of economics at Michigan State University in East Lansing. He is the author of Organizing Science for Technology Transfer in Economic Development.

WILLIAM H. KINCADE reviews

Politics of Arms Control: The Role and Effectiveness of the U.S. Arms Control and Disarmament Agency
by Duncan L. Clarke
The Free Press
269 pages, \$15.95

When chief SALT negotiator and Arms Control and Disarmament Agency (ACDA) director Paul C. Warnke resigned his posts October 1978 to return to the private practice of law, he was responding to several imperatives. The nominal reason for his departure after 20 months of controversial service was financial. A second factor was National Security Advisor Zbigniew Brzezinski's longstanding desire to gain control over U.S. strategic arms limitation policy—an objective blocked by the far more experienced, effective and technically well-versed Warnke. The third imperative was the Carter Administration's need, in the face of a difficult SALT II ratification process, to limit the sources of possible controversy and to acquire a still elusive image of toughness on issues pertaining to national defense and the Soviet Union.

But, as Duncan Clarke amply demonstrates in this excellent and intimate portrait of the Agency, Warnke was also responding to a more basic dilemma that has existed longer than ACDA. For President Carter, like several presidents before him, the predicament is to achieve progress in limiting nuclear weapons without engaging the hostility of the many powerful groups and individuals for whom ACDA is the "threat" or who, even at this late date, do not understand or accept the contribution of arms control to national security. For similar reasons, President Nixon undertook a "purge," detailed in the book, of senior of-

ficials after SALT I, cashing in them because opponents of arms limitation feared their success.

In Carter's case, the problem was aggravated by the fact that no prior president has ever given so much general and visible support to arms limitation or appointed so articulate and outspoken a proponent as Warnke to the ACDA post. Warnke's resignation thus became a political imperative for the Administration. His departure and his successor (an obscure retired general) were symbols urgently needed by a symbol-conscious Administration to reverse impressions of "softness," encouraged by its own ineptitude in explaining defense decisions, and to prepare for the last round in the already shrill debate over SALT II.

Yet the dilemma which occasioned Warnke's departure is broader and deeper than that suggested by this case alone. The underlying difficulty is how to formulate and implement American arms control policy—and to organize and staff the government for this purpose—in an environment that, for many different reasons, remains antagonistic or resistant to this enterprise. Warnke himself has called arms limitation "an unnatural act," no matter how necessary. It is to these fundamental questions that Clarke addresses his revealing, readable and well-researched study.

Though compact, *Politics of Arms Control* is inclusive. The analysis begins with the organization for and the formulation of American arms limitation policy in the Eisenhower Administration. It is a measure of the persistence of the plight of arms control that most of the issues of that era remain unresolved or only tentatively resolved even today. How are arms limitation initiatives to be integrated with long-term defense policy? Should the U.S. arms control organization be primarily a policy

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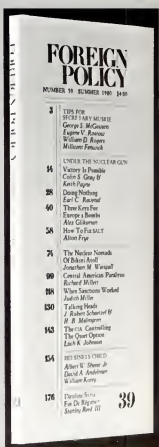
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These and at least as many more enduring questions, contradictions and "cross-pressures" are treated both analytically and historically in Clarke's account, based both on documentary evidence and on over 250 interviews with officials familiar with ACDA and its predecessor organizations. Clarke's purpose is to assess both the Agency's role, or the varying interpretations of it, and its effectiveness in carrying out that role in the 18 years of its existence.

His evaluation of the many solutions adopted or proposed by successive officials, academics and well-meaning friends of the Agency for making an unnatural act less so is an antidote to the belief that tinkering with personnel, organization, procedures or charters will alter ACDA's fundamental predicament, which, in reality, is the problem of arms control in the national security state. Whether well led and given a strong role, as during Warnke's tenure, or reduced in size and stature, as during the stewardship of Warnke's predecessor, Fred Iklé (described in the book as to the right of the Joint Chiefs on SALT), ACDA is a lightning rod. It inevitably excites controversy and opposition—even among erstwhile allies—that circumscribe its effectiveness.

Clarke's book is a wide-ranging overview and evaluation that reflects a strong sense of the Agency, its leading personalities and its political and policy milieu. Scholars, officials and advocates will find *Politics of Arms Control* indispensable to a complete understanding of American arms control policy over the last quarter century. Moreover, it draws on and adds considerably to the literature on the politics of American national security decision-making.

Yet any book peering into the life of an agency—like one disclosing a family's intimate secrets—is sure to provoke interpretive controversy or

carping about emphasis. Clarke notes that many of ACDA's problems stem from a charter requiring it to play on the fields of other departments and agencies (Energy, Defense, Central Intelligence, State, National Security Council).

Few will contest that Clarke has captured the essence of this minuscule (250 people) but vital agency. He finds that it has played a surprisingly important role as a goad, a gadfly or source of expertise in some areas of arms control and too minor a role in others, primarily because of the multitude of antagonists, cross-pressures and organizational rivals that inhibit its personnel from carrying out the agency's legal mandate. These the author sees as the realities of Washington politics. Though he thinks the agency might have been more aggressive at times, Clarke does not view these realities as sufficiently malleable to permit ACDA to outgrow its status as a "junior actor" in the foreseeable future. Quite correctly, for example, he notes that arms control will have to concern itself more and more with the weapons acquisition process, rather than with weapons already deployed. But Defense Department resistance to what it views as interference in one of its basic missions has been and will be formidable, a repetition of the general resistance ACDA has contended with since its inception.

In one of the most important chapters, Professor Clarke points out that, deprived of the levers of influence wielded by other bureaucracies (large constituency, big budget, policy primacy, etc.), ACDA is especially dependent for its success on the interest and confidence shown to its directors by more senior officials, particularly the President, Secretary of Defense, and Secretary of State. Here may lie the crux of many of the agency's problems, and

those of arms control in general.

Though every president in the nuclear age has had an arms control policy, none has made full use of the enormous educational power of the office of the chief executive to reduce the confusion in official Washington and in the country generally over the contemporary role of arms control. Much of this confusion arises from uncertainty—enshrined in ACDA's very name—about the ultimate goals of arms control. For many, arms control represents a path to (or codeword for) world peace and disarmament. This objective and those who espouse arms control are as ardently supported by some as they are feared or mistrusted by others. Still another group, increasingly including the military, sees arms control as an end in itself, a means of reducing risks, controlling threats and simplifying contingencies in a strategic environment made ever more complex by technical innovation.

Perhaps mirroring the divergent perspectives of peacemakers, pragmatists and hawks, each president has embraced arms control as the way to peace, as a way of controlling the hazards of war, and as the proximate cause for new weapons. This muddy approach promotes confusion about ends and means and prevents sustained support for ACDA.

Yet there is no need, certainly not while arms limitation is just emerging from its infancy, to resolve in advance these questions about what, ultimately, arms control can or cannot do. The more sensible approach is to find out by prudent experimentation.

In the meantime, American presidents would do their own policies and political fortunes a favor by fostering neither exaggerated hopes nor exaggerated fears, by stopping the schizophrenic pretense that arms control can be all things to all

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people, and by explaining instead what it can contribute now to American and world security.

Not having prepared the ground for an acceptance of arms control as fundamental to security in the nuclear age, each president finds he has to make real and symbolic sacrifices to obtain consent for the arms control talks or measures he knows are necessary. These sacrifices are not limited to new weapons authorizations; they include dispensing with able and experienced officials like Gerard Smith and Paul Warnke or keeping a safe distance from ACDA and its troubled image. This may be a political necessity but it is a necessity because presidents and their advisors have allowed it to become so.

As Professor Clarke notes at several points, arms control has become respectable. Even the bitterest Senate opponents of SALT II must argue, disingenuously, that its worst fault is not achieving "enough" arms limitation. No doubt they are aware of the opinion polls revealing a substantial visceral public belief that thousands more nuclear warheads do not make them feel more secure than only a few hundred.

Yet no president has systematically sought to fashion continuing support from this sensible public impulse. It therefore remains an uncertain and incipient reaction, ineffectively energized whenever an agreement is signed because of the conflicting signals coming from the White House.

How much longer American presidents can have both more nuclear weapons and more arms control remains to be seen. Yet there can be no serious and lasting strategic arms limitations unless there is a resolution of attitudes, from uncertainty about the final aims of arms limitation to the support it merits as a truly realistic element of security. For

creating such change, instead of merely ad hoc support for specific measures, no better instrument exists than the office of the president. A consistent, authoritative, forthright exposition of the relationship of arms limits to other defense policies would ease considerably the painful dilemmas that still bedevil ACDA.

Paradoxically, while arms control has gained broad if superficial public acceptance it has also come under increasing attack from both ends of the political spectrum, less on the question of goals than on matters of achievement and future directions. This is partly a product of unreasonably high claims and expectations and partly a result of the fact that the initial stock of ideas—the theory of arms control developed in the 1950s and 1960s—is in need of review, revision and replenishment. Fortunately, the last year or so has brought forth a remarkable variety of studies, notably Alan Platt's *The U.S. Senate and Strategic Arms Policy, 1969-1977* and Robin Ranger's analysis of Soviet-American negotiations, *Arms and Politics, 1958-1978*.

Professor Clarke's book, however, is the first comprehensive study of the evolution of the U.S. arms control policymaking system, of its internal politics and of the major issues it has faced. It sets a high standard which subsequent works will meet only with difficulty. Of equal importance, it will make a timely and substantial contribution to the much-needed reappraisal of American arms control policy and institutions and of their acceptance.

William H. Kincade is the executive director of the Arms Control Association in Washington, D.C., and director of the Arms Control Program for the Carnegie Endowment for International Peace.

Films

Manoeuvre

Produced by Frederick Wiseman. Distributed by Zipporah Films, 54 Lewis Wharf, Boston, Massachusetts 02110. 16 mm, B/W, 115 min., 1979. \$1,000 for five-year lease, \$135 rental.

Manoeuvre follows an infantry tank company from Fort Polk, Arkansas, through the various stages of a NATO training exercise near the East German border. It covers the transport from the United States, the drawing of tanks and armored personnel carriers, the movement to defensive positions, repulsing an enemy attack, and taking the offensive—all executed in typical Wiseman style. There is little editorial content (other than assembling the film) and no narrative; yet, the scrupulous attention to the minutiae presents a rather complete picture of what happens on a field exercise. The film shows the complexity, the masses of equipment and resources, the boredom, and the need to instill enthusiasm for the exercises (there are briefings which are replicas of football locker room pep talks).

There are some great episodes which point up the unreality of the war games mentality. In one scene a single old farmer with a shovel holds up a whole tank and armored personnel patrol—a similar patrol the previous year has wrecked his pasture. In another, two soldiers are arguing over a barrage: "If this was a real war, half of this shit wouldn't be happening. . . . You're talking about real life—I'm talking about a field problem." A third scene epitomizes

this grand *Manoeuvre*: the leaders of a patrol are faced with a real problem: in order to pull off a surprise attack they have to choose between tearing up a delicate hillside which had just been rained on or take a more open route which would increase their chance of being detected.

The value of *Manoeuvre* is that it shows the nitty-gritty of a large field exercise. It is in a certain sense an exercise in futility with little connection to reality. Readers who are interested in *Manoeuvre* should also see two other Wiseman films: *Basic Training* which follows a group of men through the whole basic training process, and *Sinai Field Mission* which covers the U.S. peacekeeping effort in the Sinai. All three films are available from Zipporah Films.□

Battleground Washington: The Politics of Pressure

Produced by Phil Lewis for ABC News. Distributed by ABC Learning Resources, 1330 Avenue of the Americas, New York, New York 10019. 3/4" videocassette, color, 52 min., 1979. \$550 purchase.

The role and influence of special interest groups in the political process are examined *Battleground Washington: The Politics of Pressure*. The film follows a prominent lobbyist on his rounds for a long-term promotion of a value-added-tax. This particular sequence provides good background on how lobbyists work.

Much of the program deals with the attempt to reform campaign finance laws. This portion starts with an interview with Dita Beard, a lobbyist tainted with the ITT scandal of 1972. It examines the increasing effect of political action committees, especially in the light of decreasing

leadership. Then it follows the progress of a campaign reform finance bill through a key House committee. The program also examines the effect of the direct mail lobbying efforts and concludes with a discussion of congresspersons who choose to represent special interests.

The Politics of Pressure is valuable because it provides insights on the lobbying process—what it is, what it accomplishes, what its proper role should be, and what abuses need to be corrected.□

The following films, Hiroshima/Nagasaki, August 1945 and Fable Safe, are two classic films which have been re-released by the Museum of Modern Art. They are reviewed here because both deserve widespread distribution. Hiroshima/Nagasaki has been seen by millions but it should continue to be seen by millions more because it documents what actually happens in nuclear war. Fable Safe is not nearly as well known, but it too deserves widespread recognition because it clearly, simply, and understandably presents the case against the continuing arms race.

—John Dowling, Film Editor

Hiroshima/Nagasaki, August 1945

Produced by Erik Barnouw and Paul Ronder. Distributed by Museum of Modern Art, Circulating Film Program, 11 W. 53rd St., New York, New York 10019. 16 mm, B/W, 16 min., 1945, re-released 1980. \$275 purchase, \$25 rental.

Immediately after the bombings of Hiroshima/Nagasaki a crew of Japanese camerapersons began to document the destruction. The project was halted by U.S. Occupation Forces and the three hours of film were classified. It was used for

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training purposes until 1968 when it was returned to the Japanese government. This version was edited by Barnouw and Ronder from the original footage.

Hiroshima/Nagasaki August, 1945

shows how terribly the Japanese people suffered from the bombings. It is the best film available which describes the utter devastation which nuclear war will bring to most in the northern hemisphere. The gruesome scenes have a very depressing effect on many viewers, so most audiences should be prepared for this. But the gruesome scenes bring home the reality of nuclear war as nothing else can. It should be required viewing for all who are concerned about the survivability of humankind. □

Fable Safe

Produced by Sumner Glimcher. Distributed by the Museum of Modern Art, Circulating Film Program, 11 W. 53rd St., New York, New York 10019. 16 mm, color, animated, 9 min., 1971, re-released 1980. \$150 purchase, \$20 rental.

Fable Safe encapsulates the arms race in a clever, comprehensive and appealing way. It shows an arms race between the superpowers based on mutual fear, misunderstandings, and misinterpretations of the other side's intentions. It defines and also uses the jargon and acronyms of the arms race to explain the arms race. *Fable Safe* is a great satire which points up the folly of the arms race as well as showing the historical progression—from one weapons system to another—until ultimate catastrophe. This little known film deserves much wider distribution. □

These films were reviewed by the Bulletin's Film Editor, John Dowling, professor of physics, at Mansfield State College (Penn.)

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MARCUS G. RASKIN

The price of defense

The April issue of the Bulletin carried two reviews of The Price of Defense: A New Strategy for Military Spending. As we regard this book as one of the most important contributions to the current nuclear arms debate, we are pleased to present still another comment on the book.—THE EDITORS

Reading *The Price of Defense* by the Boston Study Group,* I was reminded of P.M.S. Blackett: Through reasoning and operations research, the British scientist attempted to demonstrate the limits of nuclear weapons use and of bombing power, as they relate to any rational objective. But it is difficult to apply comparative calculative reasoning, or operations research, to the complexities of war, because war is an irrational set of actions of whose consequences no one can be sure.

There are those who may gain from war. Indeed, one could argue that, until Vietnam, the United States gained much from its wars. But in its most basic sense, war represents a terrifying willingness to destroy society and social systems. And where there are no clearly defined and limited purposes to the war, the weapons employed will increase the ferocity and anger of the combatants and victims.

The arms race poses this dilemma: While deterrence and the arms system are meant to stop war, the social system committed to an open-ended military buildup will make the war an unparalleled disaster. There will be a tendency to use more rather than fewer weapons, just because they

are on hand. Plans to fight a counterforce war appear rational on paper; but they must finally and ignobly end, in practice, as nightmares—and war crimes.

It is a dangerous exercise to write the history of the next world war, and especially to predict "winners." Any military activity, as Karl von Clausewitz pointed out, is prone to subjective factors which cannot be measured: the excellence of one's commanders; the willingness of the forces to believe in what they are doing and to sense that there is support for them among their people.

The extraordinary fact of our time is that no government at war with another can be completely sure of its populace for any length of time. Does anyone believe that the American people are so supine, so lacking in moral sentiment, that the use of nuclear weapons not in direct self-defense would fail to result in extraordinary resistance within our society?

The brilliance of the Vietnamese strategy, first against the French and then the Americans, was that they were able to prosecute a war of national liberation in *their own country* while appealing to the value system of independence and equality among the civil societies of the United States and France. In sum, the mere adding up of military capabilities will not foretell the victor. The Vietnamese-American war made clear that highly sophisticated technological systems are only generally understood by the average soldier. Nor is there much to suggest that invading or interventionary

forces, even where they have superior firepower, can hold any piece of territory for very long where there is determined and continuous military and nonviolent opposition.

The costs of intervention and occupation are enormous, and it is just as well that they be computed in advance, before armchair strategists assume that an interventionary force—known over this last generation as a "fire-fighting capability" or "brushfire" war capacity—can succeed over the long haul. Glib talk at Washington dinner parties, and in Congress, about occupying the Persian Gulf is not much heard among the Joint Chiefs of Staff. They have computed the cost and it is extraordinarily high. To occupy another's land is not the easiest role for a military administration. In the early 1900s it took the United States well over a decade to put down guerrilla resistance in Mindanao in the Philippines. That Nixon and Kissinger favored local proxies for imperial dirty work is understandable.

Nuclear deterrence is to national security and military managers what *Magna Carta* was to the English nobles; it gives them vested rights and legitimacy. But what does it give the rest of us? Nuclear deterrence is a hostage system. Basically, it tells an opponent's leaders: If you do things we don't like or if you use nuclear weapons first, we could destroy the civilian and industrial land space that is your past, present and much of your future.

The irony here is that deterrence strategy reflects the "soft" or "rational" position. This position is meant to hold civilization hostage with the understanding that if so ordered by "competent civilian authority," it can be destroyed. (In the United States the President gets to act as God.) But clearly, any commonsense interpretation of the inter-

*Published by Quadrangle/New York Times.

national rules of war holds that the use of nuclear weapons against innocent populations is a war crime.

"Munich" may be the major metaphor of an older generation of elites concerned with foreign and national security policy. But my generation is moved by the Nuremberg analogy and the horrors of Nagasaki. Elites who support nuclear weapons programs and urge their increase will be left "twisting slowly in the wind"—to borrow Ehrlichman's phrase—by any survivors of a nuclear war. Such survivors will wonder about nations where strategists could target the destruction of millions of people and then go out to lunch. And they will wonder about the wisdom of having put our "invulnerable deterrent," the Poseidon, in the hands of young men hardly past adolescence, often under the influence of drugs—young men used by their government as instruments of nuclear genocide.

If we do not realize that the major components of any defense system are its fundamentally human political, psychological and legal factors, we are left with a numerical, non-purposive and essentially mechanical approach to defense. I will come back to this point.

The doubts I have expressed about deterrence might be construed as lending support to a counterforce strategy. But my argument here is also predicated on the questions raised at Nuremberg. Adoption of a countervailing strategy, which supposedly means aiming at only military targets, unquestionably commits the United States to an open-ended arms race, leading to a first-strike capability. But a first-strike capability is itself a statement of aggressive war, a war that is legally indefensible.

The tougher minded might smirk at these remarks. Law, let alone justice, does not seem very relevant.

Indeed, it is often used to justify what was once considered criminal activity. An example is the CIA charter, where covert activities, including surveillance, have moved from the category of dubious or criminal behavior to protective behavior for the state. But it is important to understand that the questions pertinent to nuclear war are moral, legal and ecological ones. They are not questions of strategy.

I wish that the Boston Study Group had dealt with the implications of nuclear and interventionary strategy so that the discussions could have been more political. *The Price of Defense* does what any serious operations analysis seeks to do: it sets limits of what can and should be done through military force.

The authors do not go along with those who believe, like Secretary of Defense Harold Brown, that the TRIAD system of nuclear strategy, or the interventionary capacity to respond anywhere, is anything other than a forward military strategy with clear and undeniable imperial overtones. Although it would seem easier and more socially inventive to develop alternative energy systems, there are those who claim that the United States *must* have access to oil and be prepared to fight for it. They are edging toward the pre-World War II strategy of the Japanese military, who brought about a coup in the Japanese cabinet, with international war as the consequence.

This historical parallel should warn us to be far more precise in defining the interests and the national security of the United States. National security should be seen as the protection of the land and people of the United States, not of commercial investments, military bases or alliances. Nor should the protection

of other nations depend on the United States alone. Rather, it must be accomplished through world or collective responsibility. The purpose of the U.N. framework was to avoid having individual nations act as if they alone were carrying the torch of civilization. Thus, though it will be difficult, American statesmen, should take the position that the United States must play a *minimal* role individually, but an important collective role in the United Nations.

America need not and cannot play the role of policeman with its own rulebook. But its choice will affect the type of defense system it "buys." If the United States chooses to develop a three-ocean navy, interventionary force, covert forces and first-strike capability, as well as nuclear war-fighting capability, there will be no way to sustain democracy at home. For the enemy of democracy is war and war preparation. General Maxwell Taylor understood this point very well when he said that it was time to suppress those who do not go along with the present national military consensus.

The importance of the *Price of Defense* is that it keeps open the debate. It catches the war imperialists, taking cover under the banner of defense, quite off guard. It requires them to answer why the alternative of a collective role is not in reality one that is more secure for the United States, and indeed, for others. □



Marcus Raskin is co-founder and distinguished fellow of the Institute for Policy Studies in Washington, D.C. He is the author of *The Politics of*

National Security (1979) and *The Common Good* (forthcoming).

From Science Council of Japan

Statement from the Council in commemoration of the 25th anniversary of the Russell-Einstein Manifesto.

A quarter of a century ago, on July 9, 1955, a Manifesto signed by the two distinguished scientists, Bertrand Russell, Albert Einstein and nine other Nobel Laureates, including Hideki Yukawa, was released as a call to the whole world.

The Manifesto faced and gave a warning against the actual peril arising as a result of the development of nuclear weapons, which confronts mankind with the possibility of annihilation. It appealed to the scientists of the world, irrespective of differences of political thinking, creed, nationality, socio-economic system, to assemble in conference to deliberate how to overcome this peril. The objectives were to adopt a resolution to urge the governments of the world to realize that their purpose cannot be furthered by a world war, to recommend that all matters of dispute be settled by peaceful means, and simultaneously to initiate a signature campaign subscribing to this resolution among scientists and the general public all over the world.

The Manifesto, from the standpoint of "human-beings, members of the species Man, whose continued existence is in doubt," emphasizes the special responsibility of scientists because they do know most about the formidable dangers of nuclear warfare and consequently they should endeavour more strenuously than anyone else to bring about the complete abolition of nuclear weapons. Indeed, the Manifesto ushered in the meeting of scientists at Pugwash in 1957, where distinguished scientists from various countries of the world, including H.

Yukawa and S. Tomonaga, assembled and adopted a statement in line with the spirit of the Russell-Einstein Manifesto.

During the past 25 years, considering the opinions and movements of the peoples of the world, it is fortunate that no nuclear weapon has been used in actual warfare. Nevertheless, the possible danger of their use is growing stronger because of the recent developments of nuclear weapons systems which have invalidated the theory of nuclear deterrence—the pretext for maintaining nuclear weapons in the past.

The final document unanimously approved at the Special Session for Disarmament of the General Assembly of the United Nations held two years ago clearly stated that "Mankind today is confronted with an unprecedented threat of self-extinction" because of the accumulation of nuclear weapons.

The pressing situation in which we now find ourselves proves that the aim of the Manifesto, which recommended that every government "find peaceful means for the settlement of all matters of dispute between them" has even greater significance than when it was issued.

The Science Council of Japan, at the time of its inauguration in 1949, declared its firm determination both within Japan and overseas that it would exert itself to make science provide the basis for a cultural nation and for world peace, indicating the attitude of self-reflection of Japanese scientists. Since then, particularly since the H-bomb tests at the Bikini Atoll in 1954, the Council has ceaselessly expressed serious concern for the complete abolition of nuclear weapons and time and again has issued many recommendations, statements and appeals against testing, production, stockpiling and use of nuclear weapons.

It was only natural then, that the

Council stood firmly behind the aims of the Russell-Einstein Manifesto, and adopted a resolution to give full support to the statement of the scientists meeting at Pugwash.

As this year marks the twenty-fifth anniversary of the Russell-Einstein Manifesto, the Council, recalling its consistent stand in support of nuclear disarmament through all these years, hereby re-confirms the spirit and significance of the Manifesto and simultaneously resolves to make even greater efforts to carry out the special responsibility of scientists to attain the most earnest aspiration of humanity for the still unrealized total abolition of nuclear weapons.

We therefore call upon all scientists and scientific organizations both in Japan and overseas to support this statement of our Council and to collaborate with us in the pursuit of these aims. □

On U.S.-Soviet exchange programs

The Council of the National Academy of Sciences of the United States has reviewed the prospects of its program of scientific exchanges with the Academy of Sciences of the Soviet Union.

At the time of our previous examination of this program, in February 1980, our Foreign Associate, Andrei Sakharov, had been sent into internal exile in the Soviet Union. We remain deeply concerned by this continuing exile. Our concern is not an indication of agreement or disagreement with his expressed opinions on political issues. It is rather a concern for his rights as a scientist and as a human being and, in particular, for his freedom to pursue scientific work. Our suspension of those inter-academy exchanges involving groups of scientists was a direct expression of this concern. This concern continues.

The Council hopes that circum-

stances will so improve as to permit the resumption of this interacademy exchanges. It notes that, meanwhile, the exchange program for individual scientists still remains in place.

Our present interacademy exchange agreement with the Soviet Union expires on December 31, 1980. We have authorized our Foreign Secretary to begin discussions directed toward a new interacademy agreement more appropriate to scientific progress and with greater emphasis on multinational arrangements.

Arms control and disarmament is a central problem for both our countries. For this reason, independently of the above, the Council will press for meetings at which scientists of the United States and the Soviet Union can discuss thoroughly the technical aspects of this problem. □

Woods Hole, Mass.
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The Progressive case

The article by L. H. Tribe and D. H. Remes—"Some Reflections on the Progressive Case: Publish and Perish" (*Bulletin*, March 1980)—and G. S. Stanford's comment—"Will We Perish If We Publish" (June 1980)—will no doubt stir controversy over what properly belongs outside the government's secrecy regime.

In these articles there is no real controversy over the seriousness of Morland's revelations in terms of national security. Both argue that the *Progressive* case should simply never have gone to court on the grounds that U.S. security was seriously enough threatened to justify the imposition of prior restraint.

Stanford asserts that Tribe's and Remes' central point is that First and Fourth Amendment rights are not consistent with the nuclear age. It should be recognized that any form of strong and central security will inevitably conflict with these constitutional guarantees. As history has shown, it is high-level conflicts which pose the greatest danger. An examination of the conflicts pertinent to nuclear safeguards falls into two areas of concern—government secrecy and recovery of contraband nuclear material.

In the first, secrecy can play two roles. First, it can protect citizens from threats which otherwise might materialize far more easily and quickly. Second, it can perpetuate the status quo by withholding information which might lead a democratic society to discontinue or alter the nature of an activity. The inherent problem is that those with authority to classify information as secret are often the same as those who may benefit from maintaining the status quo. Several things can be said about this.

- The level of threat posed should not, as Stanford asserts, be directly related to the presumption toward secrecy. In American society citizens are entitled to, and in fact demand, a say in the important issues of the time. As the possible consequences of a particular action become more serious, there should be a stronger presumption toward facilitating public discussion. To delete "direct, immediate" from the legal test that prior restraint can only be evoked when publication would "surely result in direct, immediate, and irreparable damage to our nation or its people," as Stanford suggests, would unquestionably be a serious erosion of First Amendment guarantees.

- Nuclear energy and nuclear weapons are inextricably linked. The global debate over weapons proliferation and nuclear energy revolves around this linkage and is very political in nature. If nuclear weapons are easy to construct, given the material an advanced nuclear energy fuel cycle will utilize, this should be made known to the public who must bear the risks. Further, knowledge of the general details of weapons design is not the same as fabricating the device, and equating the two is ludicrous. Also, defense-related plutonium production reactors produce tons of the very material Stanford correctly states is not presently in the civilian energy sector. The details of this production are secret and, therefore, beyond public scrutiny, and it is the likelihood of a similar trend in nuclear energy production with which Tribe and Remes are concerned.

- The distinction between deducible and nondeducible information is soft at best. The results of arduous experimentation and testing may be "nondeducible," but it is the "direct, immediate, and irreversible" harm the information will pro-

duce which is the central issue in prior restraint cases. Ultimately all information is deduced. After the United States demonstrated that fission explosives were possible, other nations developed their own designs. The inescapable fact is that once a design is demonstrated others will "rediscover" the design.

- The *Progressive* case shows that seeking prior restraint is the government's sole response in most secrecy cases. If the editors of *Progressive* had not sought government review, as they did, they could have published the article freely as did *Take Over* and *Majority Report*. Why is it that seeking prior restraint ended government involvement if this issue was truly sensitive to national security?

- Howard Morland clearly was able to discuss thermonuclear weapons technology with scientists who felt they were not revealing potentially harmful information. The fact that the Los Alamos Scientific Laboratory Library had declassified versions of the same information indicates that some classification officers felt that the information was not seriously sensitive. The whole affair puts a "chilling effect" on all discussions by government scientists on weapons-related topics. If declassification is not sufficient to guarantee freedom of discussion, the message is that one should discuss nothing even remotely sensitive with journalists.

In the second area, it can be argued that Fourth Amendment guarantees are clearly threatened by the use of plutonium or highly enriched uranium in the civilian energy sector. Several assertions should be put to rest on this score.

- Reactor grade plutonium can be used to make fission explosives. To quote F. C. Iklé, former Director of the U.S. Arms Control and Dis-

armament Agency (*Bulletin*, January 1980):

"This misunderstanding was compounded by the persistence within the U.S. government of a specific piece of misinformation: the claim that the plutonium from power reactors was normally not suitable for making bombs. It is not quite clear why so many technically competent people helped to propagate this erroneous notion. It is clear, unhappily, that some used it deliberately to deceive their superiors as to the dangers of plutonium reprocessing. Some West European statesmen, it seems, were thus misled to underrate the danger of plutonium from power reactors. Professor Albert Wohlstetter's inquiry into this matter (using data that had already been declassified) has helped greatly to put an end to this deception, once and for all."

- The copious and penetrating radiation which Stanford claims will permit simple detection of contraband plutonium can, in fact, be shielded very easily, either by distance (any large building forces detectors outside their range) or by use of simple shielding such as earth (lead is not necessary). In fact, a typical fallout shelter constructed in the 1960s would be perfectly suitable. It should also be pointed out that the exact sensitivity of remote location devices is classified as secret, making true public discussion of this subject impossible. However, any good physicist could deduce that shielding contraband special nuclear materials from detection is not a serious obstacle.

- The possibility of using "doctored" nuclear fuel which is more difficult to handle or conceal has already been "carefully examined" in the Department of Energy's Nonproliferation Alternative Systems

Assessment Program and found not to be useful.

It is worth noting that any high level of security, in itself, seriously threatens First and Fourth Amendment guarantees. Whether that security is a result of an advanced nuclear energy fuel cycle or any other advanced technology for massive destruction, they all pose the same threat to civil liberties. It is interesting that there is not much public concern over the potential theft of an already fabricated nuclear explosive device or plutonium from a defense production facility. Responsible anti-nuclear groups do not challenge the huge defense-related nuclear program to anything approaching the same degree. This lack of concern may be attributable to the high level of secrecy surrounding the defense programs and this is what justifiably concerns Tribe and Remes.

In essence, Tribe and Remes have performed a very profound service by pointing out that the high level of security which may accompany a nuclear fuel cycle utilizing materials capable of producing a nuclear explosion will have some adverse effects on civil liberties. Constitutional guarantees generally erode in a stepwise fashion which dictates that concern should be voiced at a sufficiently early stage to engender real debate over the activity in question. To label such considerations as the domain of the unthinking or uninformed is an attempt to deny civil libertarians their proper place in public debates over activities of great importance. Protecting the constitutional guarantees we, as Americans, have fought so hard to preserve is of paramount importance. To assert otherwise is a clear disservice.□

JOHN N. O'BRIEN
Brookhaven National Laboratory
Upton, New York

Stab misdirected

Anthony Fainberg lectures me in his letter (November 1979) about my presumed ignorance of the appropriate dose units (rem instead of person-rem). Checking the original confirmed that the error was the *Bulletin's*, not mine. Fainberg's stab was therefore misdirected.

The remainder of his defensive re-

sponse to my letter was quite irrelevant to the fundamental issue of responsibility which I raised about an editorial in the *Bulletin*. A piece of disingenuous industry propaganda had been presented side-by-side with a description of the most serious nuclear power accident so far, claiming that they have equivalent content of truth. The Editor's description (or "alternative" view) of what happened at Three Mile Island was subsequently amply supported by the President's Commission.

Either Fainberg's mind was closed to the essence of my concern or he considered it unassailable, except by the common political tactics of an attack on my credibility.

RUDI H. NUSSBAUM
Portland, Oregon

Editor's note: We are sorry for the error and the consequent misunderstanding.

What's in a name?

You do us an injustice: in the editorial in your June issue you refer to "military technocrats."

I refer you to the definition of technocracy in Webster's *Third New International Dictionary*: "1. government or management of the whole of society by technical experts or in accordance with principles established by technicians. 2. an organization of technicians that studies the possibilities of government in accordance with principles set up by technicians."

The use of the world "technocrats" in the above context was inappropriate. You could have referred to these warmonger-types merely as militarists.

JOHN SHELDON
Technocracy Inc.
Savannah, Ohio

A welcome proposal

Publication of the excellent article "The Public and Technological Decisions" by Abrams and Primack (June 1980) is another commendable step by the *Bulletin* to foster the development of new institutions to meet the needs of our times. Congratulations to you and the authors. The "critical review and public assessment" proposal they outline to replace adversary procedure has much to recommend it. I do suggest, however, that before this proposal becomes adopted and enshrined by acronym into our social structure that a new name be found for it; we've got enough CRAPA already!

E. H. COPELAND
Albuquerque, New Mexico

Unseen tremors

"When the war comes Europe will be devastated. The Russians will be everywhere. Only in America will there be some safety." The speaker is a friend, a Munich businessman on tour in New York, looking at the sights, checking the banks, watching for parcels of land, resuming a fight that he started as a child after the Russians broke through the German lines at the Elbe on the last long assault of World War II. "I have been told that the best places to look for farmland are in Maryland and Carolina. Is that true?" He looks at me, expecting a reasoned response and I wonder if my face reflects the confusion in my mind. He is grimly serious. He is preparing for Armageddon, the decisive battle.

Many of my Central European friends have begun the transformation to displaced persons, refugees of the mind who respond to a variation of Santayana's dictum that only a generation intimately exposed to the cycles of war and uncertainty

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understand: those who remember history are bound to relive it. He remembers the hunger and terror of the war and is looking for a modest farm to which he can relocate. "The only problem is how to pay. It is difficult to arrange the transfer of funds from my bank to an American bank. I must find a way." How will he manage the logistics of his move? At what sign will he gather his family and fly to his farm in the new world? And who will prepare and maintain the land for him in the meantime?

During the Napoleonic wars, as antagonists slid from belligerence to open hostilities, the officers would sharpen their swords on the embassy steps of their enemy and shout defiance. Today there is no time for bravura. As tensions rise people are stirred to movement. They prepare to take to the roads, to abandon their homes in the hope that they will survive. The cities are grand targets, places to be destroyed, killing grounds for those who will not or cannot flee. They are losing the vision of peace and the hope that reason will overwhelm the insane push to war.

I remember walking with a friend through the quiet shadows of the Vienna Woods. "This small stand of trees is very important. After the first war my family used much of it for fuel to heat the house and for cooking. The same was true after the second war. It saved our lives. We will always see that it grows." Such memories are the muscle and sinew of the body politic and they impel people to act. War is not an abstraction to them but a force of nature, a cataclysm as inevitable as death. Any European who is old enough to remember what happened will tell you how they survived.

Chinese geologists have noted that animal behavior changes before an earthquake and that these changes can be used to predict the place and

magnitude of the impending disaster. People also detect the unseen tremors of the catastrophes lying in wait for them. The nuclear holocaust may have already happened, triggered by events past, moving toward its climax over the dampened will of a resigned people. □

IRVING A. LERCH
New York, N.Y.

Enough gloom and doom

I find your magazine a depressing disappointment. Every issue contains somebody or other bemoaning the threat of nuclear war *ad nauseam* in the same endless rhetoric of academics talking to other academics that has been going on for 30 years and got nowhere. The means to fight such a war is with us and won't go away. What can be eradicated, now, is the motivation for anybody to want to start one, and that means breaking free from the mental straitjacket of believing in the myth of finite resources by committing Western know-how and productivity to a massive program to raise Third World living standards and wealth per capita to a level comparable to that of North America.

Only nuclear power in the form of fission, followed by fission-fusion hybrid technology, followed by a global fusion economy can hope to do that. The potential is there, the resources are unlimited, and the problems can be solved. I had hoped that in the *Bulletin* I would find a positive attitude of mind and an expression of the belief that humanity is still at the beginnings of an adventure that will take it out of the solar system and on to whatever comes after that, not that it's all over before it has begun. Instead I found, both in your contributors and your advertisers, a preponderance of

doom, gloom, wishy-washy environmentalist "solutions" which fail even to address the problem let alone solve it, and zero-growth Club-of-Rome back-to-the-Dark-Ages defeatism.

Einstein's universe was shown to have to be either expanding or contracting; there's no stable static model. It's the same with civilization. The only long-term alternative to nuclear reactors is nuclear bombs, the only alternative to "up," "down," and the only alternative to "out to the stars," "back to the Stone Age," either by the quick, catastrophic route or by the long, agonizing one.

Human reason in the form of science and technology has freed more people on this planet from oppression, poverty, famine, disease, and ignorance than all the cults, creeds, isms, and ologies put together, and there is absolutely no case for imagining that the same could not continue and emancipate the whole of humankind once and for all. So some people would find it hard to adjust. That's tough. Would they rather have to adjust to conditions comparable to those of, say, Somalia, Ethiopia, Thailand, or Cambodia? I'm sure that the inhabitants of such places would trade their circumstances quite happily for ours, and willingly accept the problems that would come with the deal.

I had hoped to find a magazine that was scientifically enlightened and took a positive stand against the wave of anti-nuclear hysteria that has gripped our society, but instead I found a posture that could only be described as apologetic and indecisive. When Science abdicates in this fashion, the door is left open for policy-makers to be influenced by technically illiterate lawyers, movie stars, crackpot sociologists and so on whose voices are completely out of proportion to their competence.

This is already happening, the flames being fueled by a gleeful sensation-seeking media who have brought about the virtual shutdown of what was once the world's most advanced nuclear industry, and we are beginning to see the consequences.

I don't want to pay to read any more of it, and would be grateful if you would please terminate my subscription.

JAMES P. HOGAN
Altamonte Springs, Florida

Dear Mr. Hogan:

I'm rather disappointed in your letter—not in the content but the tone. Even if I agreed completely with the long-term solution that you outline for all of mankind's ills (and I'm not 100 percent sure I do, though I'm willing to accept your outline as a working hypothesis), there remains the frighteningly difficult problem of how we are to get from here to there without being atomized along the route.

Sincerely,
Bernard T. Feld

Registering a protest

I am 24 years old, a computer programmer, and not presently in danger of being drafted for military service. However, if I were 18 or 19 years old, I would refuse to register for the draft. It is clear from statements made by President Carter and other government leaders that the reason we need draft registration is to ensure that we have enough men on call to stop the Russians from disrupting the flow of oil to the United States and its allies, mainly Western Europe and Japan.

But what have these countries done to eliminate their need for oil? The answer is: a big Zero. Instead of embarking on a crash program to convert from coal and oil to solar energy and wind power, they are either waiting in vain for the United States to come up with something, or they are heavily committing themselves to nuclear power: the most complicated, waste producing, carcinogenic, expensive, accident-

prone method of boiling water since before the Stone Age.

If one picks up his daily newspaper he can read about shutdowns and accidents at nuclear plants around the world—shutdowns for leaky valves, shutdowns because of radioactive gas and water leaks (all within "acceptable levels," of course), shutdowns because an operator's shirt snagged a switch, and most ridiculous of all, plants which did not shut down when expected to!

Instead of converting all of their thermal power plants to wind power, the Washington Public Power Supply System is throwing away \$16 billion of their customers' money to build five new nuclear plants. Instead of converting all gasoline-powered cars to battery/electricity power, the United States and its allies are spending tens and hundreds of billions of dollars on MX missiles, MIRVs, cruise missiles, Trident submarines, and the like. These weapons programs are developed with one concept in mind: mass destruction. They are not capable of saving a single human life, but they are exceedingly capable of destroying millions of lives and making this planet virtually uninhabitable for hundreds of years.

Instead of exporting solar cells and solar technology, Western Europe is pushing nuclear power plants and uranium to Third World countries.

We should resist at all costs our government's efforts to gear up for another war. It's time for us to declare that we can live without nuclear power, we can live without OPEC, and we can live without Exxon. It's time to stop talking about energy independence and time to starting spending the Big Bucks to get us there.

BRUCE GORDON
Portland, Oregon

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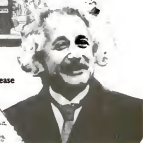
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